COMPAQ

ProLiant ML350

Setup and Installation Guide

First Edition (September 2000)
Part Number 201345-001
Compaq Computer Corporation

For use with 1-GHz or greater Intel Pentium III processor-based server models only

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About This Guide

This guide is designed to be used as step-by-step instructions for installation and as a reference for operation, troubleshooting, and future upgrades.

Text Conventions

This document uses the following conventions to distinguish elements of text:

Keys	Keys appear in boldface. A plus sign (+) between two keys indicates that they should be pressed simultaneously.
USER INPUT	User input appears in a different typeface and in uppercase.
FILENAMES	File names appear in uppercase italics.
Menu Options, Command Names, Dialog Box Names	These elements appear in initial capital letters.
COMMANDS, DIRECTORY NAMES, and DRIVE NAMES	These elements appear in uppercase.
Type	When you are instructed to *type* information, type the information **without** pressing the **Enter** key.
Enter	When you are instructed to *enter* information, type the information and then press the **Enter** key.

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Symbols in Text

These symbols may be found in the text of this guide. They have the following meanings.

WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life.

CAUTION: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of information.

IMPORTANT: Text set off in this manner presents clarifying information or specific instructions.

NOTE: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Symbols on Equipment

The following symbols may be placed on equipment to indicate the presence of potentially hazardous conditions:

This symbol, in conjunction with any of the following symbols, indicates the presence of a potential hazard. The potential for injury exists if warnings are not observed. Consult your documentation for specific details.

This symbol indicates the presence of hazardous energy circuits or electric shock hazards. Refer all servicing to qualified personnel.

WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure. Refer all maintenance, upgrades, and servicing to qualified personnel.

This symbol indicates the presence of electric shock hazards. The area contains no user or field serviceable parts. Do not open for any reason.

WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure.

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This symbol on an RJ-45 receptacle indicates a Network Interface Connection.

WARNING: To reduce the risk of electric shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.

This symbol indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists.

WARNING: To reduce the risk of injury from a hot component, allow the surface to cool before touching.

These symbols, on power supplies or systems, indicate the equipment is supplied by multiple sources of power.

WARNING: To reduce the risk of injury from electric shock, remove all power cords to completely disconnect power from the system.

This symbol indicates that the component exceeds the recommended weight for one individual to handle safely.

Weight in kg
Weight in lb

WARNING: To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manual material handling.

Important Safety Information

Before installing this product, read the *Important Safety Information* document provided.

Getting Help

If you have a problem and have exhausted the information in this guide, you can get further information and other help in the following locations.

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Compaq Technical Support

In North America, call the Compaq Technical Support Phone Center at 1-800-OK-COMPAQ. This service is available 24 hours a day, 7 days a week. For continuous quality improvement, calls may be recorded or monitored.

Outside North America, call the nearest Compaq Technical Support Phone Center. Telephone numbers for worldwide Technical Support Centers are listed on the Compaq website. Access the Compaq website by logging on to the Internet at

http://www.compaq.com

Be sure to have the following information available before you call Compaq:

- Technical support registration number (if applicable)
- Product serial number
- Product model name and number
- Applicable error messages
- Add-on boards or hardware
- Third-party hardware or software
- Operating system type and revision level

Compaq Website

The Compaq website has information on this product as well as the latest drivers and Flash ROM images. You can access the Compaq website by logging on to the Internet at

http://www.compaq.com

Compaq Authorized Reseller

For the name of your nearest Compaq authorized reseller:

- In the United States, call 1-800-345-1518.
- In Canada, call 1-800-263-5868.
- Elsewhere, see the Compaq website for locations and telephone numbers.

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Chapter 1

Server Features

The Compaq *ProLiant*™ ML350 delivers the latest performance features at a very competitive price. Whether deployed in either a workgroup setting within a large corporation or as the primary server in a small-to-medium business, the ProLiant ML350 is an ideal server for applications such as file and print services, shared Internet access, and small databases. This business-critical server delivers Intel Pentium III technology, error checking and correcting (ECC) memory, an easy-to-service chassis, and leading server management tools such as *Compaq Insight Manager*™ and ROM Based Setup Utility (RBSU). Server features include:

- Latest Intel Pentium III processor with 133-MHz system bus
- Dual processor capability
- 133-MHz Registered ECC synchronous dynamic random access memory (SDRAM) DIMMs
- Capacity for four 1-inch hard drives in the hard drive cage
- Support for hot-plug hard drives (on some models)
- Four removable media bays (two available)
- Integrated Dual Channel Wide-Ultra3 SCSI Controller
- Integrated Compaq Fast Ethernet NIC 10/100 Auto Switching Network Controller
- Four 64-bit PCI slots and two available 32-bit PCI slots
- IDE CD-ROM drive

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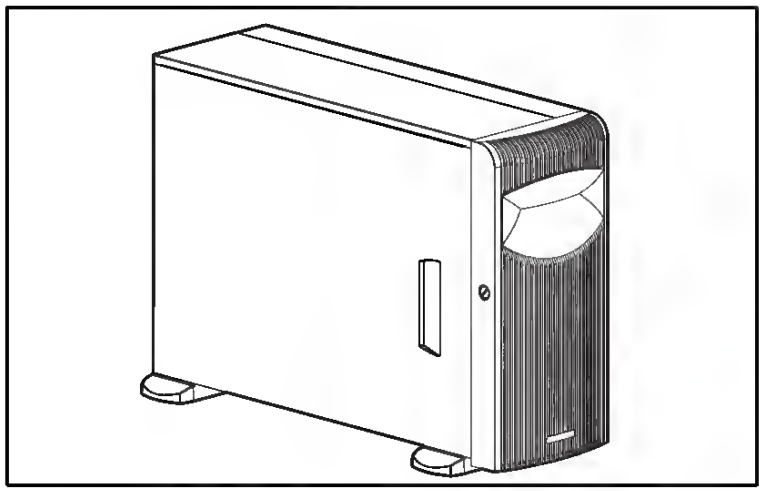

Figure 1-1. ProLiant ML350

Standard Hardware Features

The features on the following pages are standard on the ProLiant ML350, unless otherwise noted.

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Front Panel Components

Figure 1-2 and Table 1-1 show the components on the front panel of the ProLiant ML350.

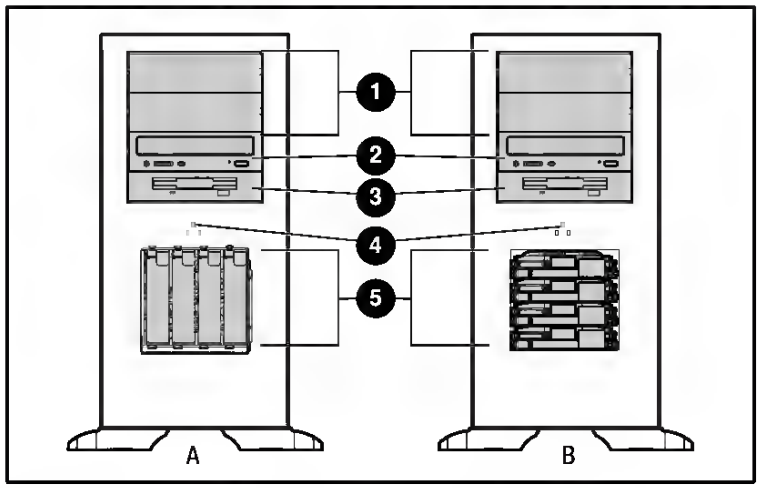

Figure 1-2. Identifying front panel components with bezel removed: A (non-hot-plug), B (hot-plug)

Table 1-1
Front Panel Components – A (Non-Hot-Plug), B (Hot-Plug)

Item	Component
❶	Removable media bays
❷	CD-ROM drive
❸	Diskette drive
❹	Power button
❺	Hard drive bays A (non-hot-plug), B (hot-plug)

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Rear Panel Connectors

WARNING: This equipment is designed for connection to a grounded (earthed) outlet. The grounding type plug is an important safety feature. To reduce the risk of electric shock or damage to your equipment, do not disable this feature.

Figure 1-3 and Table 1-2 show the connectors on the rear panel of the ProLiant ML350.

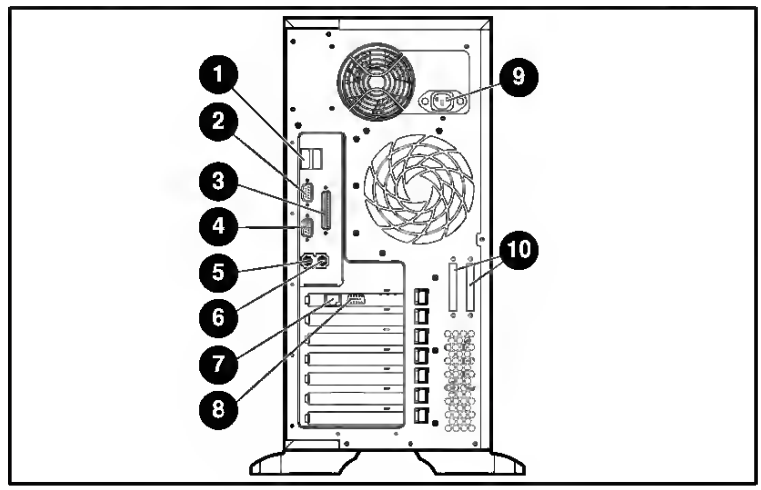

Figure 1-3. Identifying rear panel connectors

Table 1-2
Rear Panel Connectors

Item	Connector	Item	Connector
❶	USB ports	❻	Mouse connector
❷	Serial port A connector	❼	RJ-45 Ethernet connector
❸	Parallel port connector	❽	Video connector
❹	Serial port B connector	❾	Power cord connector
❺	Keyboard connector	❿	SCSI connector knockouts

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Drive Dimensions

The ProLiant ML350 supports a maximum of eight internal drives (four are intended for removable media drives and four are for hard drives). Figure 1-4 and Table 1-3 show the drive configuration.

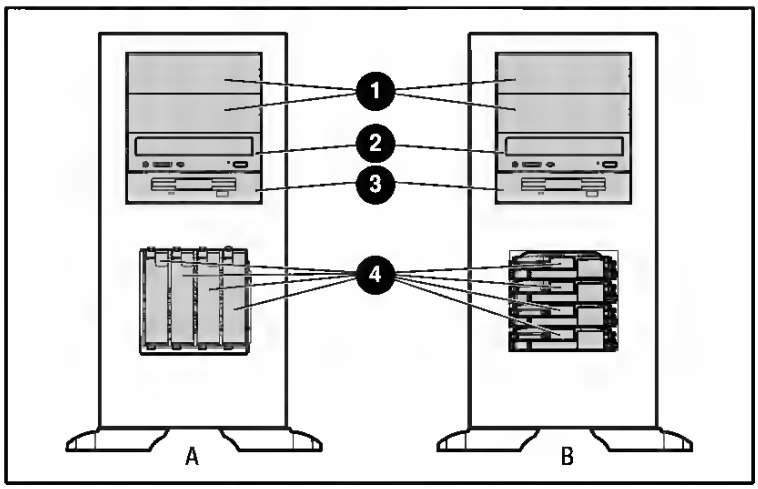

Figure 1-4. Identifying drive dimensions with bezel removed: A (non-hot-plug), B (hot-plug)

Table 1-3
Drive Bay Dimensions – A (Non-Hot-Plug), B (Hot-Plug)

Item	Dimension	Item	Dimension
❶	5.25-inch half-height available removable media drive bays	❸	5.25-inch half-height 1.44-MB diskette drive bay
❷	5.25-inch half-height IDE CD-ROM drive bay	❹	(A) 3.5-inch x 1-inch non-hot-plug hard drive bays (B) 3.5-inch x 1-inch hot-plug hard drive bays

Note: The available removable media drive bays can be occupied by any half-height device such as a 12/24-GB DAT tape drive or 2 media bays can be occupied by a full-height device such as a DLT tape drive.

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System Board Components

Figure 1-5 and Table 1-4 show the components and connectors on the system board of the ProLiant ML350.

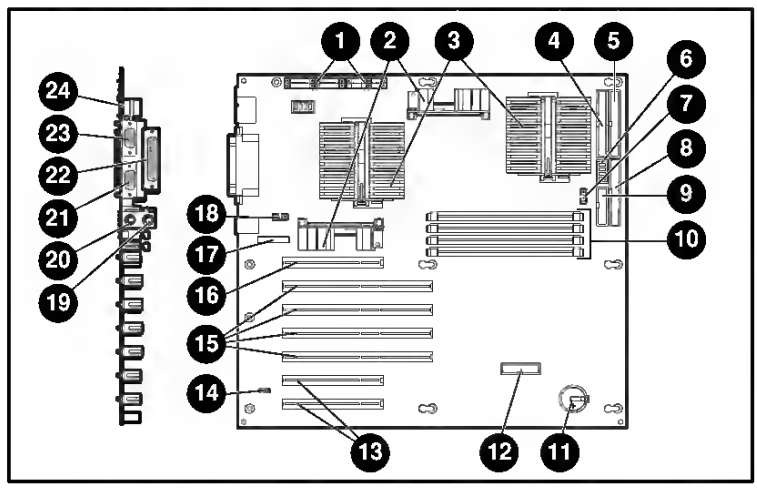

Figure 1-5. Identifying system board components

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Table 1-4
System Board Components

Item	Component	Item	Component
❶	Power supply connectors	⓭	32-bit PCI slots
❷	Processor Power Modules (PPM)	⓮	Wake On LAN connector
❸	Processor sockets	⓯	64-bit PCI slots
❹	Primary IDE controller	⓰	32-bit PCI slot 1 (Server Feature Board)
❺	Secondary IDE controller	⓱	Server Management Information Cable (SMIC) connector
❻	System configuration switch (SW1)	⓲	System fan 1 connector
❼	System fan 2 connector	⓳	Mouse connector
❽	Diskette drive controller	⓴	Keyboard connector
❾	Power button connector	㉑	Serial port B connector
❿	DIMM slots	㉒	Parallel port connector
⓫	Battery	㉓	Serial port A connector
⓬	Remote Insight Board (RIB) connector	㉔	USB ports

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Processors and System Memory

- Pentium III processor with integrated 256-KB Advanced Transfer Cache and Dual Processor capability
- Error checking and correcting (ECC) for memory error detection and correction
- 128-MB PC 133-MHz Registered ECC SDRAM DIMM, system memory
- Support for either 128-, 256-, 512-MB, or 1-GB PC 133-MHz Registered ECC SDRAM DIMMs
- Supports up to four PC 133-MHz Registered ECC SDRAM DIMMs
- DIMMs may be installed one at a time

Expansion Slots

- Seven expansion slots (six available): four 64-bit PCI slots and three 32-bit PCI slots (two available)
- PCI bus provides peripheral transactions at a bus clock speed of up to 33 MHz
- 3.3-volt compatible

Disk Controller

- Integrated Dual Channel Wide Ultra3 SCSI Controller on the PCI local bus. The controller provides either two internal SCSI buses, two external SCSI buses, or one internal and one external SCSI bus. This controller performs at a maximum data transfer rate of 160 MBps.
- Optional controller boards for controller duplexing or expanding storage capacity are available.

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Network Interface Controller

The ProLiant ML350 has an Integrated Compaq Fast Ethernet Network Interface Controller (NIC) 10/100 Autoswitching Network Controller.

Ports/Connectors

- Serial (2)
- Parallel
- Keyboard
- Mouse
- USB (2)

BIOS

- Compaq *ROMPaq*™ Utility for BIOS firmware upgrade
- ROM Based Setup Utility (RBSU) for system configuration

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Server Feature Board Components

Figure 1-6 and Table 1-5 show the components on the ProLiant ML350 Server Feature Board.

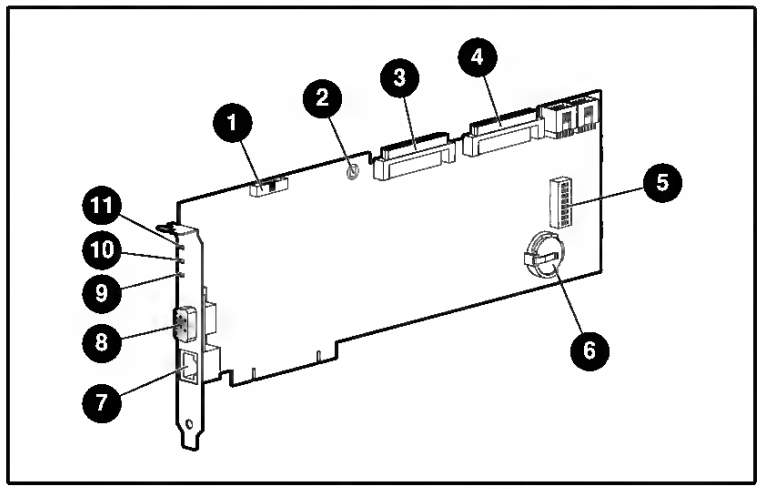

Figure 1-6. Identifying Server Feature Board components

Table 1-5
Server Feature Board Components

Item	Component	Item	Component
❶	Server Management Information Cable (SMIC) connector	❼	RJ-45 Ethernet connector
❷	NMI debug button	❽	Video connector
❸	SCSI channel B	❾	NIC link status indicator
❹	SCSI channel A	❿	100-Mb connection indicator
❺	Server Feature Board configuration switches	⓫	Activity indicator
❻	Replaceable lithium battery (CR2032)		

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Interfaces

- Integrated Dual Channel Wide-Ultra3 SCSI Controller
- Integrated Compaq Fast Ethernet NIC 10/100 Autoswitching Network Controller

Video

- Integrated ATI Rage XL Video Controller providing maximum resolution of 1280 x 1024 noninterlaced at 16.7 million colors
- Supports SVGA, VGA, and EGA graphics resolution

Power Supply

- 300-watt power supply with power factor correction

Warranty

- Three-Year Onsite Limited Worldwide Warranty
- Compaq Pre-Failure Warranty on processors, hard drives, and memory

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Server Configuration and Management

The ProLiant ML350 offers an extensive set of features and optional tools to support effective server management and configuration, including:

- ROM Based Setup Utility (RBSU)
- Compaq *SmartStart*™
- Compaq Insight Manager
- Diagnostic features (POST, DIAGS, ROMPaq, ASR)

ROM Based Setup Utility (RBSU)

The RBSU (or **F9** setup) performs a wide range of configuration activities, including the following:

- Viewing system information
- Selecting the operating system
- Configuring system devices and installed options
- Selecting the primary boot controller
- Managing storage options

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Compaq SmartStart

Compaq SmartStart, located on the SmartStart and Support Software CD, is the intelligent way to set up your Compaq server. SmartStart includes:

- ROMPaq Utility
- Driver updates
- Assisted operating system installations

For information concerning SmartStart, refer to the Server Setup and Management pack included in the shipping box.

Compaq Insight Manager

Compaq Insight Manager, which is loaded from the Compaq Management CD, is an easy-to-use software utility for collecting server information. Compaq Insight Manager performs the following functions:

- Forwards server alerts and fault conditions
- Monitors fault conditions and server performance
- Controls server security and configuration
- Remotely controls server
- Initiates rapid recovery services

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Diagnostic Features

The software and firmware diagnostic features available for your use include:

- Power-On Self-Test (POST)
- Diagnostics (DIAGS)
- ROMPaq utilities to upgrade flash BIOS
- Automatic Server Recovery (ASR)

Security Features

Security features include:

- Setup Password
- Power-up Password
- Diskette Drive Control
- Diskette Write Control
- Diskette Boot Override
- Serial Interface Control
- CD Boot Override
- Parallel Interface Control
- Power Switch Protection
- Bezel Lock

Most security features are established through the RBSU. For information concerning server security features, refer to the SmartStart and Support Software CD included in the shipping box.

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Chapter 2

Overview of Server Installation

The following instructions are provided as an overview for first-time installation of your ProLiant ML350. If you have any problems, contact your Compaq authorized reseller.

WARNING: To reduce the risk of electric shock or damage to the equipment:

- Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.
- Disconnect power from the server by unplugging the power cord from either the electrical outlet or the server.
- Do not place anything on power cords or cables. Arrange them so that no one can accidentally step on or trip over them. Do not pull on a cord or cable. When unplugging from the electrical outlet, grasp the cord by the plug.

CAUTION: Electrostatic discharge can damage electronic components. Be sure you are properly grounded (earthed) before beginning any installation procedure. See Appendix B, "Electrostatic Discharge (ESD)," for more information.

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Preinstallation Procedures

Selecting a Site

Make sure the installation area you select has the following features:

- Sturdy, level installation site that includes dedicated and properly grounded (earthed) circuits, air conditioning, and static electricity protection
- Clearance of 7.6 cm (3 in) at front and back of the server for proper ventilation
- Separate electrical circuit for the server

CAUTION: Protect the server from power fluctuations and temporary interruptions with a regulating uninterruptible power supply (UPS). This device protects the hardware from damage caused by power surges and voltage spikes, and keeps the system in operation during a power failure.

Unpacking the Server

Unpack the server, keyboard, and cables according to the instructions and illustrations printed on the shipping carton(s).

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Locating Materials

Locate the following materials that were shipped with your ProLiant ML350:

- Keyboard
- Mouse
- Power cord
- Documentation label inside the server (most of the option installation and setup instructions are located on the label, which is attached to the inside of the access panel)
- Documentation and software packs inside the shipping box: Server Setup and Management, Reference Information, and Software Products

In addition to these supplied items, you may need:

- Torx T-15 screwdriver
- Options to be installed, such as expansion boards, monitors, uninterruptible power supply (UPS), or memory
- Application software

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Identifying the Rear Panel Connectors

Install as directed in one of the following two installation sequences. Identify the power cord and peripheral devices to the connectors located on the rear panel of the server as described in Figure 2-1 and Table 2-1.

WARNING: To reduce the risk of electric shock or fire, do not plug telecommunications or telephone connectors into the Network Interface controller (NIC) receptacle.

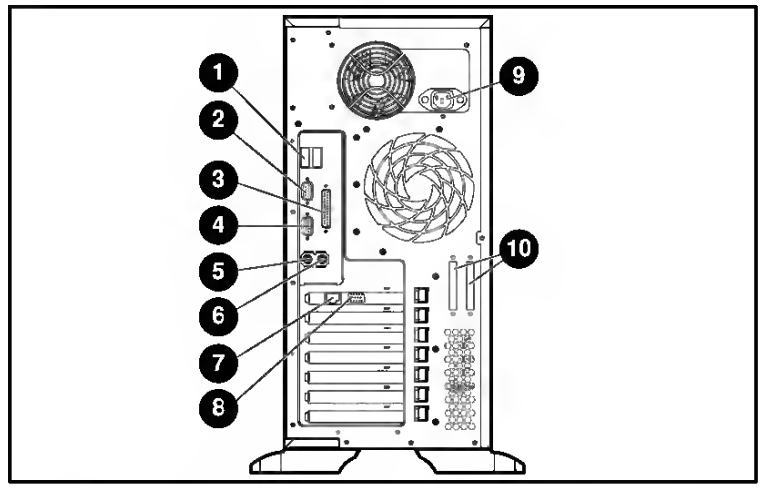

Figure 2-1. Identifying rear panel connectors

Table 2-1
Rear Panel Connectors

Item	Connector	Item	Connector
❶	USB ports	❻	Mouse connector
❷	Serial port A connector	❼	RJ-45 Ethernet connector
❸	Parallel port connector	❽	Video connector
❹	Serial port B connector	❾	Power cord connector
❺	Keyboard connector	❿	SCSI connector knockouts

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Installation Sequence

CAUTION: If your server has a factory-installed operating system, configure it using the instructions in the following section. Otherwise, follow the instructions in the "Operating System Purchased Separately" section later in this chapter.

Preconfigured Operating System

If you ordered your server with the factory-installed operating system, everything required to install your operating system is already on the server. Refer to the steps provided in the *Compaq Factory-Installed Operating System Software User Guide* for more information on using your operating system.

1. Select a site and unpack the server, keyboard, and mouse. See "Preinstallation Procedures" earlier in this chapter.
2. Connect the cables: keyboard, mouse, monitor, network, and power. See "Identifying the Rear Panel Connectors" earlier in this chapter.
3. Locate the key and unlock the front bezel if necessary.

   NOTE: A key hook is located inside the front bezel above the keylock latch. For your convenience, you may use the key hook to store the key when it is not needed.

4. Power up the server by opening the front bezel and pressing the power button on the front of the server.

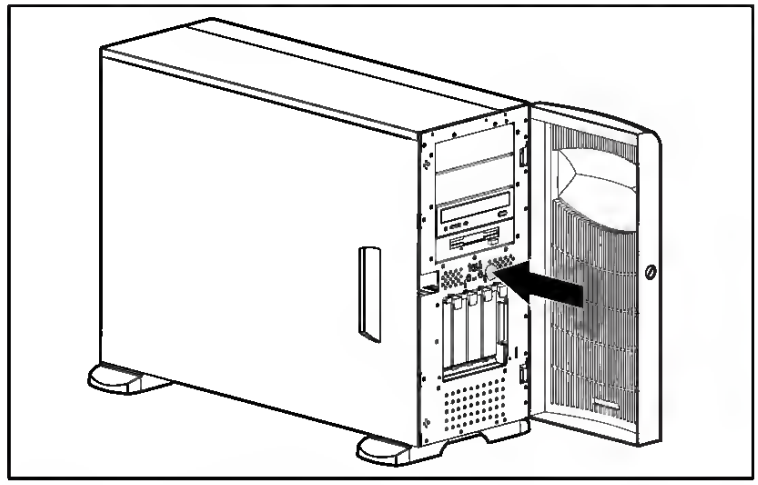

Figure 2-2. Powering up the server

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WARNING: To reduce the risk of electric shock or damage to the equipment

- Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.
- Disconnect power from the server by unplugging the power cord from either the electrical outlet or the server.
- Do not place anything on power cords or cables. Arrange them so that no one can accidentally step on or trip over them. Do not pull on a cord or cable. When unplugging from the electrical outlet, grasp the cord by the plug.

5. Follow the on screen instructions to complete the factory-installed operating system initialization process. After initialization is complete, the server will automatically go through POST.
6. Install the Compaq Management Agents on the server. Refer to Chapter 5, "Server Configuration and Utilities," and the Compaq Management CD for information about installing the Compaq Management Agents for your operating system.
7. After your server configuration is complete, back up your server.
8. Install any application software.
9. Register your server. For server registration information, refer to the Server Setup and Management pack shipped with your server or register your Compaq server online at

   www.compaq.com/register

   Send us your name, server serial number, and operating system (OS) information. You may also use your Compaq Server Profile Diskette to register after configuring your server with SmartStart. Simply follow the instructions on our website and insert the Compaq Server Profile Diskette when prompted.

This procedure completes the installation. If you need to install additional options not preinstalled on your server, follow the steps in "Installing a Second Processor and Processor Power Module (PPM)" in Chapter 3. Otherwise, you may skip the remainder of the chapter.

CAUTION: Use the SmartStart and Support Software CD as recovery software only. Powering up the server from the SmartStart and Support Software CD reconfigures the system and causes all data on the server to be lost.

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Operating System Purchased Separately

If you purchased your operating system separately, install it using the SmartStart and Support Software CD. Refer to the Server Setup and Management pack for instructions on using SmartStart. The first time the server is configured, the SmartStart program automatically creates a necessary partition on your hard drive. This partition cannot be used for any other purpose and is not a traditional system partition.

The following sequence should be performed when setting up your server for the first time:

IMPORTANT: To reduce the risk of damage to your server, complete the installation process by following the detailed procedures provided later in this chapter and in other sections of the setup and installation guide.

1. Select a site and unpack the server, keyboard, and mouse. See "Preinstallation Procedures" earlier in this chapter.
2. Install any PCI expansion boards if needed. See Chapter 3, "Hardware Options Installation," or see the options kits for detailed installation instructions.
3. Install any other options: additional memory, hard drives, and external storage devices. See Chapter 3, "Hardware Options Installation," or see the options kits for detailed installation instructions.

IMPORTANT: After installing options, you need to run the ROM Based Setup Utility (RBSU) to change the boot device after completing this setup process. See Chapter 5, "Server Configuration and Utilities," for more on running RBSU.

4. Connect cables: keyboard, mouse, monitor, network, and power. See "Preinstallation Procedures" earlier in this chapter.
5. Set switches: system board switches, Server Feature Board switches, and SCSI ID settings. If changes are required, see Chapter 3, "Hardware Options Installation."
6. Locate the key and unlock the front bezel if necessary.

   NOTE: A key hook is located inside the front bezel above the keylock latch. For your convenience, you may use the key hook to store the key when it is not needed.

7. Power up your server by pressing the power button on the front of the server.

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8. You may configure certain system features using either the SmartStart and Support Software CD (recommended) or RBSU that is embedded in the server ROM.

   - Place the SmartStart and Support Software CD in the CD-ROM drive and power up the server again. Follow the onscreen instructions to complete the server initialization process. For SmartStart and Support Software CD initialization procedures, refer to the Server Setup and Management pack shipped with your server or see Chapter 5, "Server Configuration and Utilities."

   -Or-

   - Run RBSU by pressing **F9** when prompted in the lower right corner of the screen. Use RBSU to verify the type of operating system, verify the boot controller order, and set the date and time. For information on using RBSU to configure other server features, see Chapter 5, "Server Configuration and Utilities."

9. Install the operating system.

10. Install Compaq Insight Manager to manage the server. For Compaq Management CD initialization procedures, refer to the Server Setup and Management pack shipped with your server.

IMPORTANT: You must install and use Compaq Insight Manager to benefit from the Compaq Pre-Failure Warranties on processors, hard drives, and memory modules.

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11. Install any application software needed.

12. Register your server. For server registration information, refer to the Server Setup and Management pack shipped with your server or register your Compaq server online at

    www.compaq.com/register

    Send us your name, server serial number, and operating system (OS) information. You may also use your Compaq Server Profile Diskette to register after configuring your server with SmartStart. Simply follow the instructions on our website and insert the Compaq Server Profile Diskette when prompted.

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Chapter 3

Hardware Options Installation

This chapter provides procedures for installing, removing, and replacing hardware options in the ProLiant ML350.

CAUTION: Electrostatic discharge (ESD) can damage electronic components. Be sure you are properly grounded (earthed) before beginning any installation procedure.

Powering Down the Server

Before installing or removing options, prepare your server by following these steps:

CAUTION: Failure to follow these directions could result in damage to equipment or loss of information.

1. Back up your server data and record configuration information.
2. Power down the operating system (OS) in an orderly manner, as directed in your OS instructions.
3. Power down the server by pressing the power button on the front of the server.

IMPORTANT: The system power in the ProLiant ML350 does not completely power down with the front panel power button. To completely remove all power from the system, you must disconnect the power cord from the server.

4. Remove the power cord.

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WARNING: To reduce the risk of injury from electric shock or damage to the equipment when installing an upgrade, make sure that the server is powered down. Remove all AC power cords to completely disconnect power from the system.

5. Disconnect any other external equipment connections to the server.

Opening or Removing the Bezel

CAUTION: Before removing the bezel, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet.

1. Follow the steps in "Powering Down the Server" at the beginning of this chapter.
2. If necessary, unlock the bezel using the included key ❶.
3. Open the bezel ❷ fully to the right.

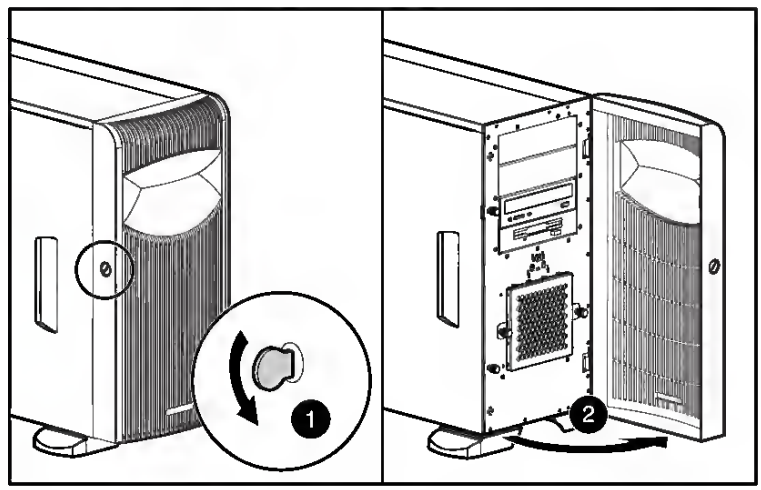

Figure 3-1. Unlocking the keylock and opening the bezel

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4. To remove the bezel, lift the bezel upward, and pull it away from the chassis.

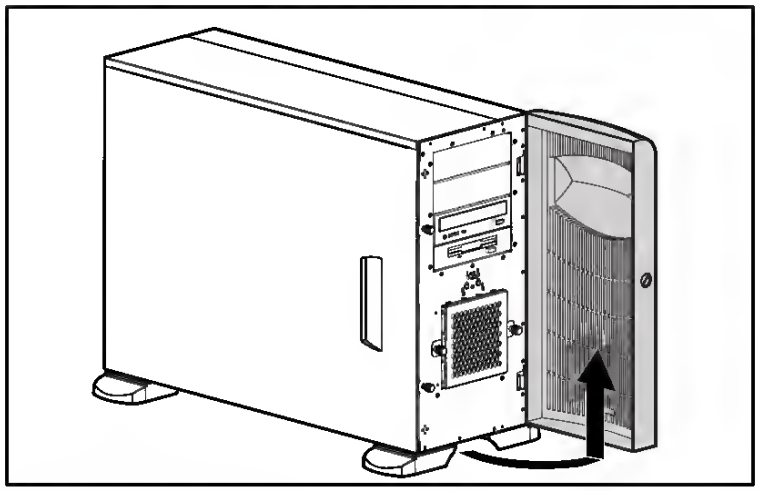

Figure 3-2. Removing the bezel

To replace the bezel, reverse the above procedure.

NOTE: When replacing the bezel, be sure the bottom hinge points are properly placed in the chassis before rotating the bezel back into its original position.

Removing the Access Panel

To remove the access panel:

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching.

CAUTION: Before removing the access panel, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet.

CAUTION: Do not operate the server with the large access panel removed. This panel is an integral part of the cooling system and removing it while the system is running may adversely affect data integrity.

1. Follow the steps in "Powering Down the Server" at the beginning of this chapter.
2. If necessary, unlock the bezel door.

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3. Open the bezel fully to the right.
4. Loosen the two thumbscrews ❶ located on the left side of the front chassis.
5. Slide the access panel ❷ back about 1.5 cm (0.5 in).
6. Lift and remove the panel.
7. Turn the access panel over to locate the System Configuration Label. This label provides information on installing processor board options, configuring drives, installing drives, and setting switches.

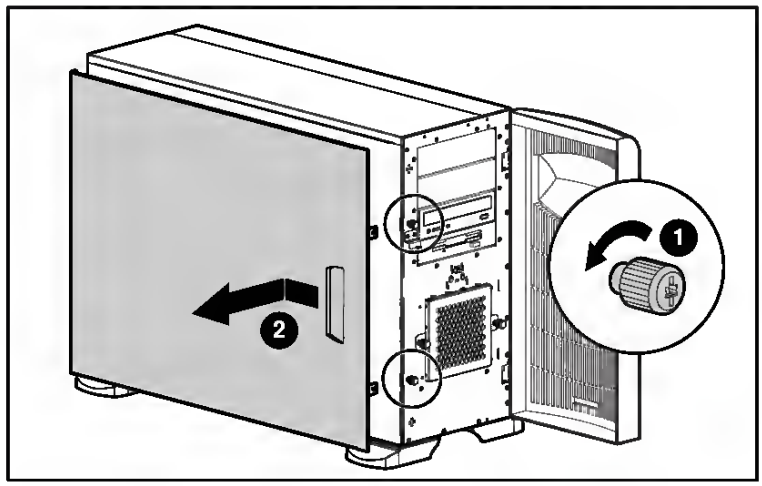

Figure 3-3. Loosening the thumbscrews and removing the access panel

To replace the access panel, reverse the above procedure.

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Removing the Removable Media Device Blanks

NOTE: The blanks must be removed from the chassis to install a storage device in its place. The tray on the blank is used to mount hard drives into removable media device bays.

To remove a removable media device blank from the front chassis:

CAUTION: Before removing a removable media device blank, make sure that the server is powered down, all cables are disconnected from the server, and the power cord is disconnected from the grounded (earthed) AC outlet.

1. Follow the steps in "Removing the Access Panel" earlier in this chapter.
2. Push up on the drivelock ❶ to release the blanks.
3. Gently pull the blank ❷ away from the front chassis, then remove the blank.

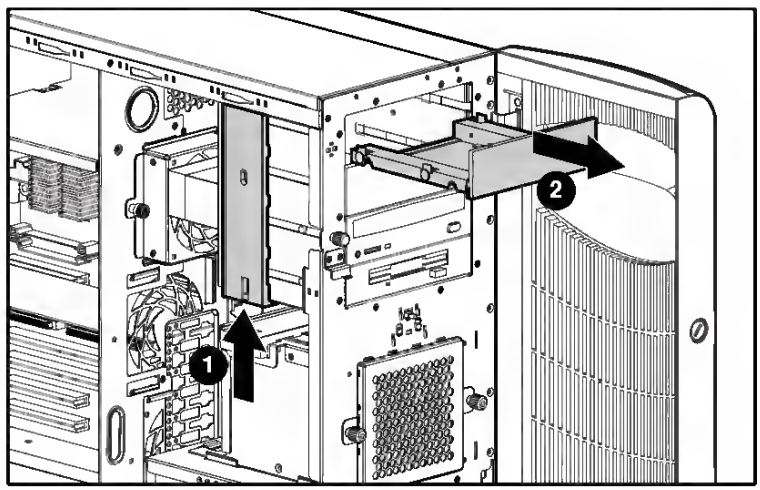

Figure 3-4. Pushing up on the drivelock and removing a removable media device blank

NOTE: The interior of the server may look different depending on the model purchased.

To replace a removable media device blank, reverse the above procedure.

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Storage Devices

This section discusses removal and replacement procedures for the storage devices supported on the ProLiant ML350.

Drive Dimensions

The ProLiant ML350 supports a maximum of eight internal drive bays (four are intended for removable media drives and four are for hard disk drives). Figure 3-5 and Table 3-1 show the drive configuration.

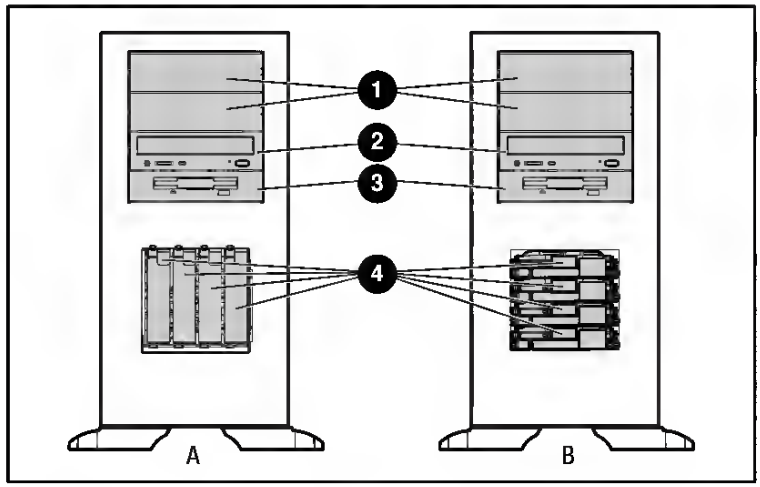

Figure 3-5. Identifying drive dimensions, A (non-hot-plug drives), B (hot-plug drives)

Table 3-1
Drive Bay Dimensions – A (Non-Hot-Plug), B (Hot-Plug)

Item	Dimension	Item	Dimension
❶	5.25-inch half-height available removable media drive bays	❸	5.25-inch half-height 1.44-MB diskette drive bay
❷	5.25-inch half-height IDE CD-ROM drive bay	❹	(A) 3.5-inch x 1-inch non-hot-plug hard drive bays (B) 3.5-inch x 1-inch hot-plug hard drive bays

Note: The open removable media drive bays can be occupied by any half-height device such as a 12/24-GB DAT tape drive or 2 media bays can be occupied by a full-height device such as a DLT tape drive.

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Identifying Guide Screws

When installing drives, you must install guide screws to ensure the drives correctly align in the drive cage. Compaq has provided extra guide screws. They are located behind the side panel of the server. Some options use 5.25 M3 metric screws and some use HD 6-32 screws. The metric screws supplied by Compaq are black.

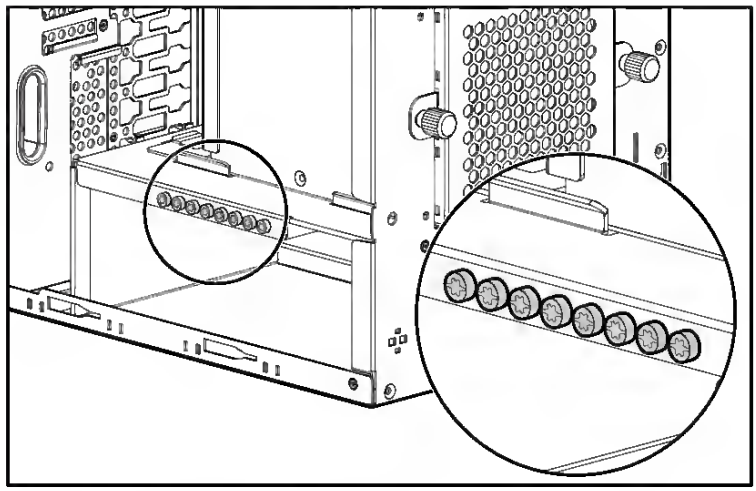

Figure 3-6. Identifying drive guide screws

NOTE: The interior of the server may look different depending on the model purchased.

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Installation Guidelines for SCSI Hard Drives

Consider the following guidelines when installing SCSI hard drives:

- Install drives into the bays in the following order: 0, 1, 2, 3, 4, 5, 6.
- Assign SCSI device IDs in the following order: 0, 1, 2, 3, 4, 5, 6.

See Figure 3-7, Figure 3-8, and Chapter 4, "Cabling Guidelines," for additional information.

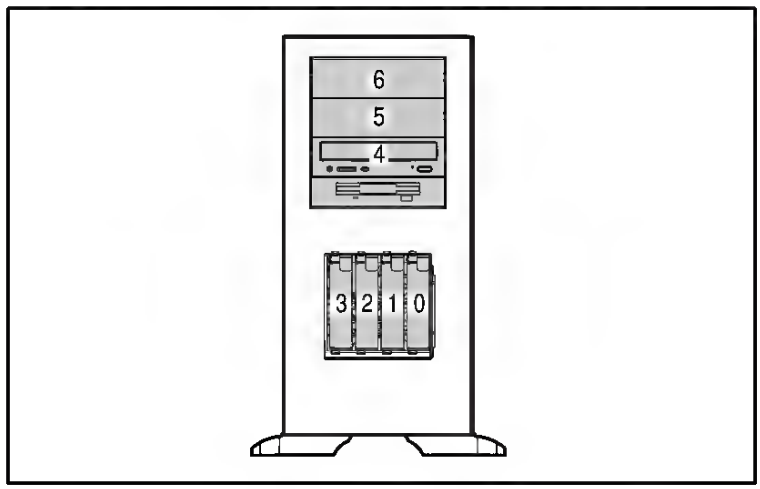

Figure 3-7. Non-hot-plug SCSI hard drive bay configuration

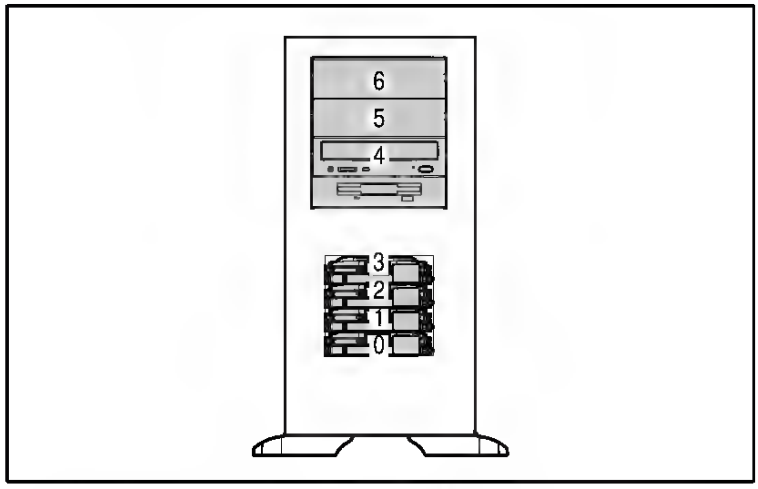

Figure 3-8. Hot-plug SCSI hard drive bay configuration

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Installing a Non-Hot-Plug Hard Drive into a Non-Hot-Plug Drive Cage

To install a 3.5-inch non-hot-plug hard drive into a non-hot-plug drive cage:

CAUTION: Before removing the bezel, make sure that the server is powered down, all cables are disconnected from the server, and the power cord is disconnected from the grounded (earthed) AC outlet.

1. Follow the steps in "Removing the Access Panel" and "Removing the Removable Media Device Blanks" earlier in this chapter.
2. Loosen the thumbscrews ❶ and remove the drive cage door ❷.

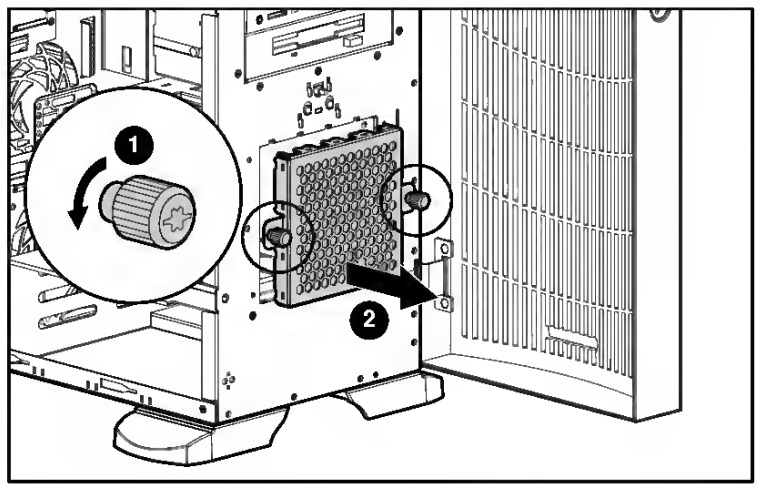

Figure 3-9. Loosening the thumbscrews and removing the drive cage door

3. To configure the device, set the SCSI ID. You must manually set the SCSI ID on each device to a unique value in the range of 0 to 6 for each SCSI bus. Refer to the documentation provided with the drive for instructions on setting the SCSI ID.

IMPORTANT: It is recommended that you set the SCSI ID equal to the bay number. See Figure 3-7 for bay numbering.

4. Remove all terminating jumpers from third-party SCSI devices. (Compaq SCSI non-hot-plug hard drive cables are terminated.)
5. Install two guide screws on each side of the drive. Be sure the rear screws are secured in the holes farthest back on the drive and the guide screws line up with the guide slots.

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6. Slide the drive into the drive bay until the rear screw clicks into place. Fill the drive bays from right to left.

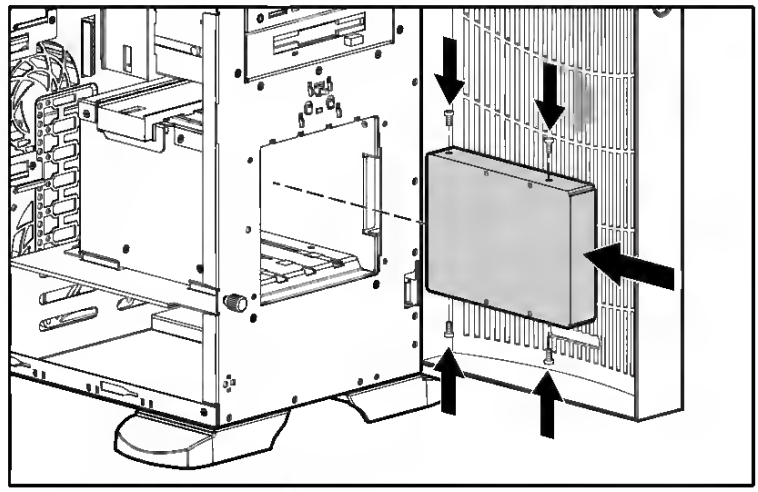

Figure 3-10. Installing a 3.5-inch hard drive

NOTE: The interior of the server may look different depending on the model purchased.

7. Connect the power cable and data cable to the back of the device.

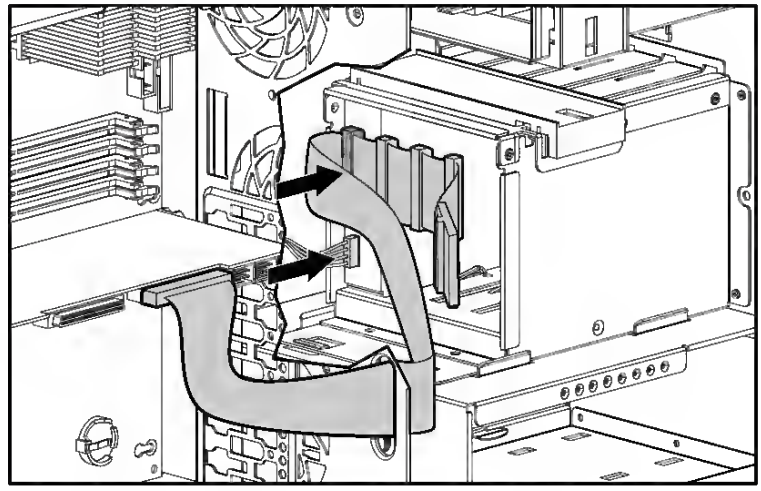

Figure 3-11. Cabling the drives

NOTE: The interior of the server may look different depending on the model purchased.

8. Replace the drive cage door. Replace the access panel and the bezel.

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Removing a Non-Hot-Plug Hard Drive from a Non-Hot-Plug Drive Cage

To remove a 3.5-inch non-hot-plug hard drive from a non-hot-plug drive cage:

CAUTION: Before removing the access panel, make sure that the server is powered down, all cables are disconnected from the server, and the power cord is disconnected from the grounded (earthed) AC outlet.

1. Follow the steps in "Removing the Access Panel" earlier in this chapter.
2. Disconnect the power cable and data cable from the back of the hard drive.

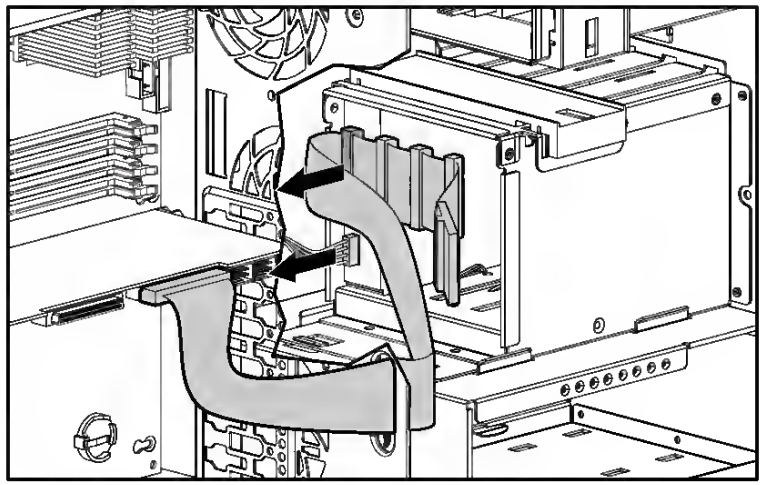

Figure 3-12. Disconnecting the hard drive cables

NOTE: The interior of the server may look different depending on the model purchased.

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3. Press inward on the release tab ❶ and gently pull the drive ❷ out of the drive bay.

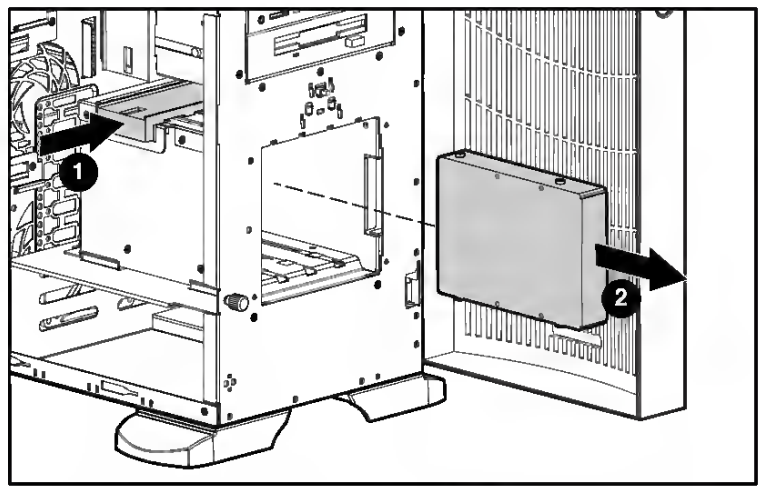

Figure 3-13. Removing a non-hot-plug hard drive from a non-hot-plug drive bay

4. Remove the two guide screws from each side of the drive.
5. Install a hard drive blank into the empty drive bay.
6. Reinstall the access panel.

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Installing and Removing a Hot-Plug Hard Drive

To install a hot-plug hard drive, first review the installation documentation that came with the drive.

1. Follow the steps in "Opening or Removing the Bezel" to access the hot-plug hard drive bays.
2. Slide the release latch ❶ and remove the hard drive blank ❷.

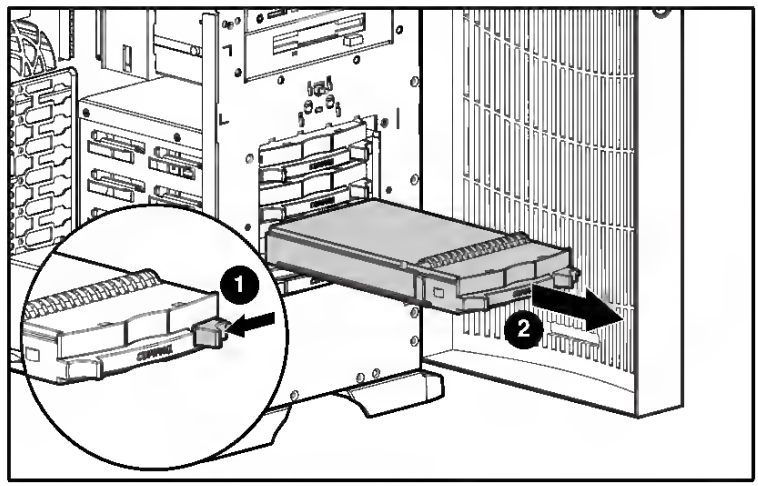

Figure 3-14. Removing the hard drive blank

3. Slide the hard drive release latch ❶ to open the ejector lever ❷.

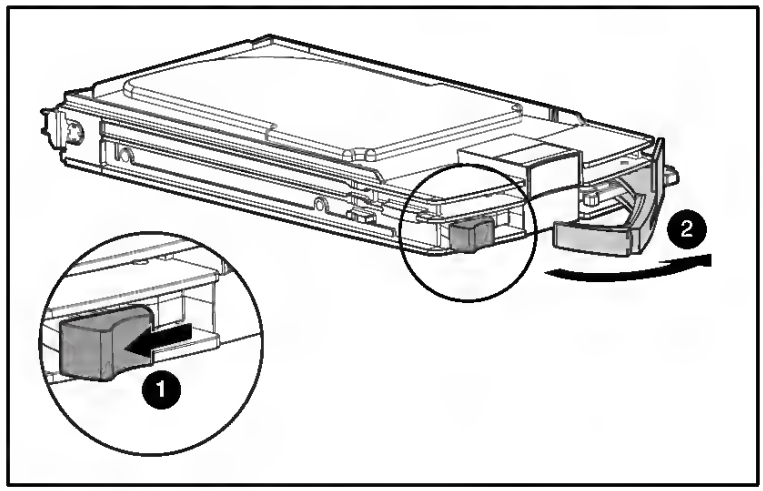

Figure 3-15. Opening the ejector lever

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4. Insert the hot-plug hard drive into the lowest available hot-plug drive bay ❶ and close the ejector lever ❷.

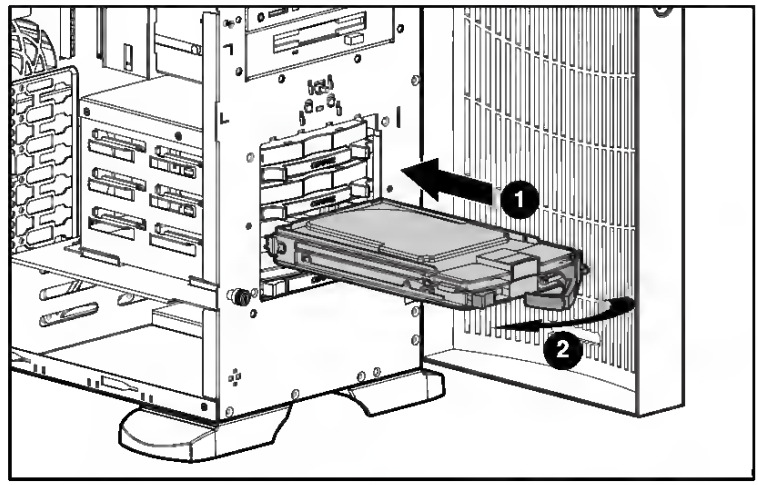

Figure 3-16. Inserting the hot-plug hard drive and closing the ejector lever

To remove a hot-plug-hard drive reverse these procedures.

IMPORTANT: A hard drive blank must be installed into the empty drive bay or the system will not operate properly.

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Installing a 3.5-Inch Non-Hot-Plug Hard Drive Into a 5.25-Inch Hard Drive Adapter

IMPORTANT: If you are installing a 3.5-inch hard drive into a removable media device bay for the first time, you must use the hard drive adapter found in the removable media device blanks. See "Removing the Removable Media Device Blanks" earlier in this chapter.

To install a 3.5-inch hard drive into a 5.25-inch hard drive adapter:

CAUTION: Before removing the access panel, make sure that the server is powered down, all cables are disconnected from the server, and the power cord is disconnected from the grounded (earthed) AC outlet.

1. Follow the steps in "Removing the Access Panel" and "Removing the Removable Media Device Blanks" earlier in this chapter. The removable media device blank now becomes the hard drive adapter.
2. Place the hard drive ❶ into the hard drive adapter.
3. Tighten the alignment screws ❷ on each side of the adapter to secure the hard drive into the adapter.

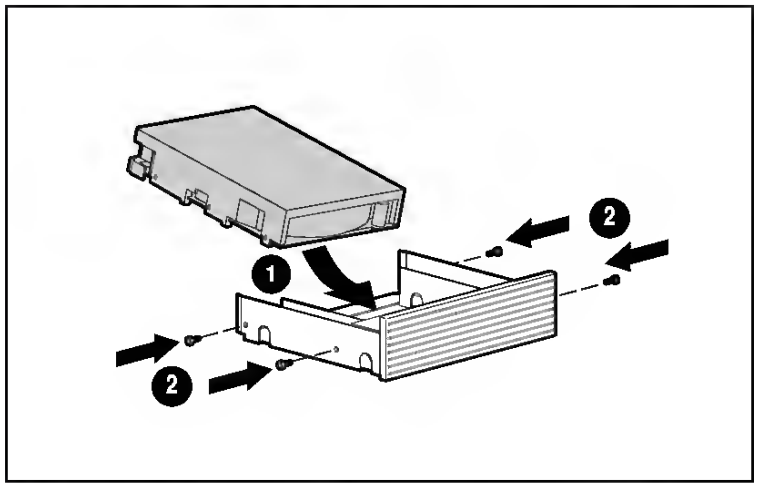

Figure 3-17. Installing a 3.5-inch hard drive into a 5.25-inch hard drive adapter

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Installing a Device Into a Removable Media Device Bay

The ProLiant ML350 includes four removable media device bays. The lower two bays are occupied with a 3.5-inch diskette drive and an IDE CD-ROM drive; the upper two removable media device bays are vacant. You can install two half-height devices or one full-height device into these bays.

IMPORTANT: You must set the SCSI device ID equal to the bay number. Select a unique SCSI device ID for each device. See Figure 3-8 for bay numbering.

Installing a Half-Height Removable Media Device

To install a 5.25-inch device:

CAUTION: Before removing the access panel, make sure that the server is powered down, all cables are disconnected from the server, and the power cord is disconnected from the grounded (earthed) AC outlet.

1. Follow the steps in "Removing the Access Panel" at the beginning of this chapter.
2. To configure the device, set the SCSI ID. You must manually set the SCSI ID on each device to a unique value. Refer to the documentation provided with the device for instructions on setting the SCS1 ID.
3. Remove all terminating jumpers from third-party SCSI devices. (Compaq SCSI non-hot-plug hard drive cables are terminated.)
4. Install guide screws on the sides of the drive.
5. Slide the drive into the drive bay until it clicks into place.

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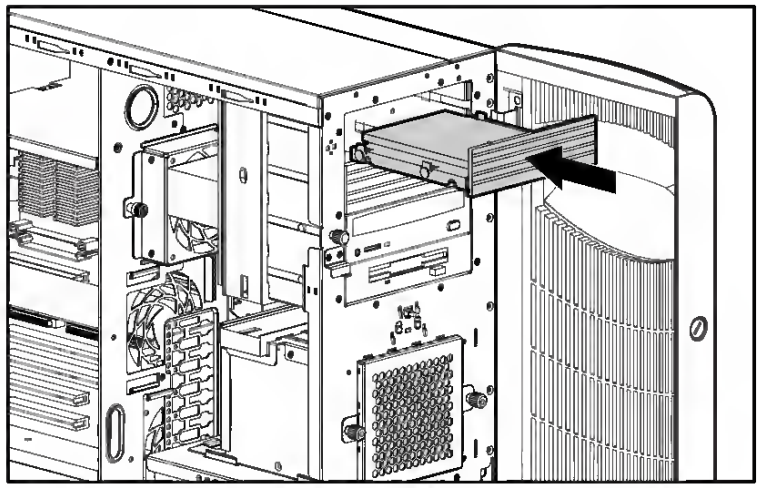

Figure 3-18. Installing a device mounted inside a 5.25-inch drive adapter

NOTE: The interior of the server may look different depending on the model purchased.

6. Connect the data cable ❶ and power cable ❷ to the back of the drive.

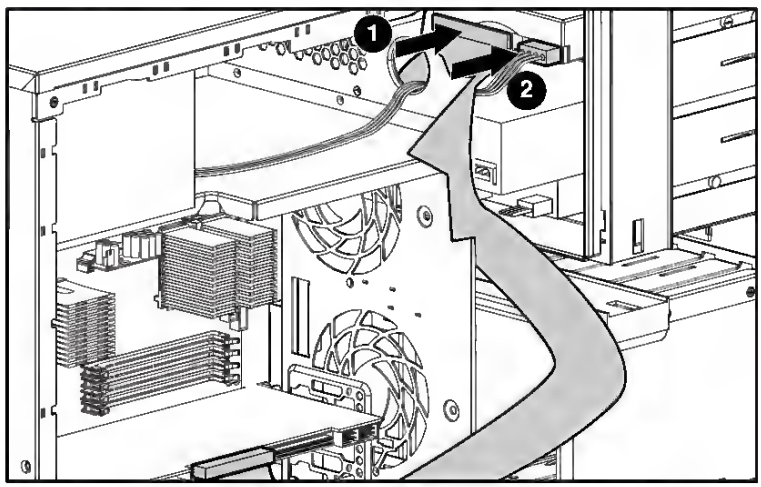

Figure 3-19. Connecting the drive cables

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Installing a Tape Drive

To install a tape drive:

CAUTION: Before removing the access panel, make sure that the server is powered down, all cables are disconnected from the server, and the power cord is disconnected from the grounded (earthed) AC outlet.

1. Follow the steps in "Removing the Access Panel" at the beginning of this chapter.
2. Install guide screws on the sides of the drive.
3. To configure the device, set the SCSI device ID. You must manually set the SCSI device ID on each device to a unique value in the range of 0 to 6 for each SCSI bus. Refer to the documentation provided with the drive for instructions on setting the SCSI device ID.
4. Slide the drive into the drive bay until it clicks into place.

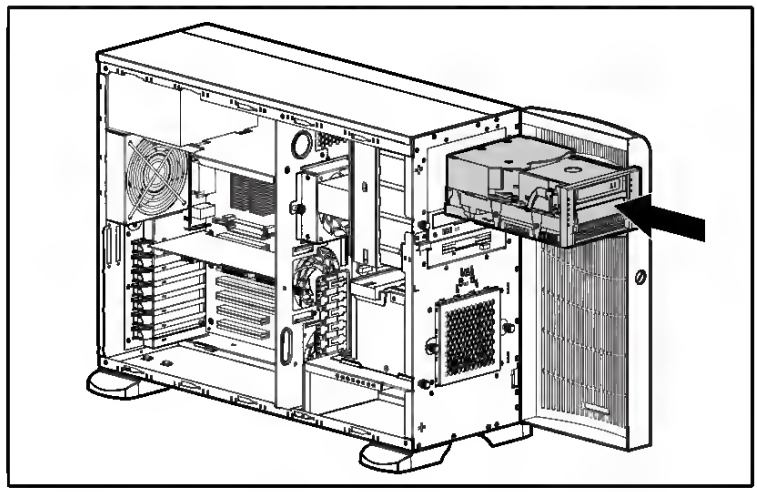

Figure 3-20. Installing a tape drive

NOTE: The interior of the server may look different depending on the model purchased.

NOTE: Compaq recommends installing the tape drive on a separate SCSI cable to avoid a decrease in performance of other SCSI devices.

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5. Connect the data cable ❶ and power cable ❷ to the back of the drive.

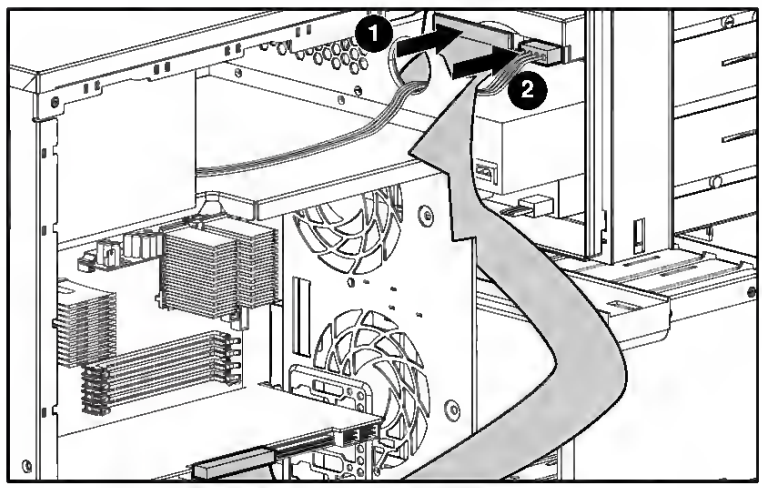

Figure 3-21. Connecting the tape drive cables

Removing a Device from the Removable Media Bay

To remove a tape drive or other device:

CAUTION: Before removing the access panel, make sure that the server is powered down, all cables are disconnected from the server, and the power cord is disconnected from the grounded (earthed) AC outlet.

1. Follow the steps in "Removing the Access Panel" at the beginning of this chapter.

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2. Disconnect the power cable and data cable from the back of the tape drive.

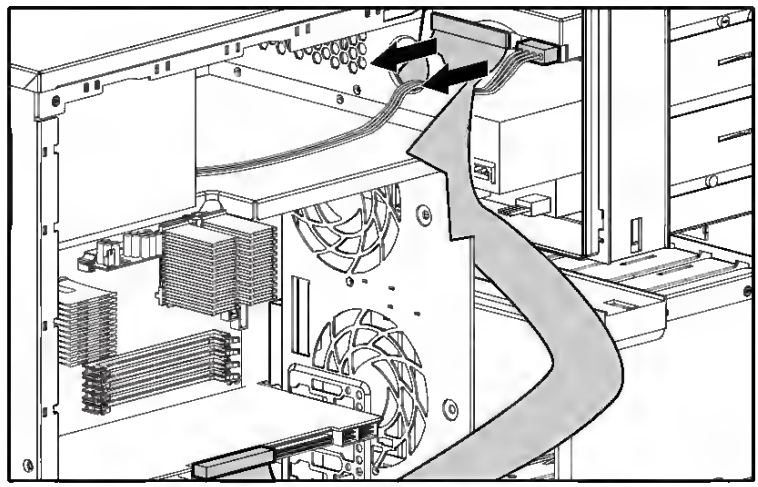

Figure 3-22. Disconnecting the tape drive cables

3. While pushing the drivelock ❶ up, pull the drive ❷ out of the drive bay.

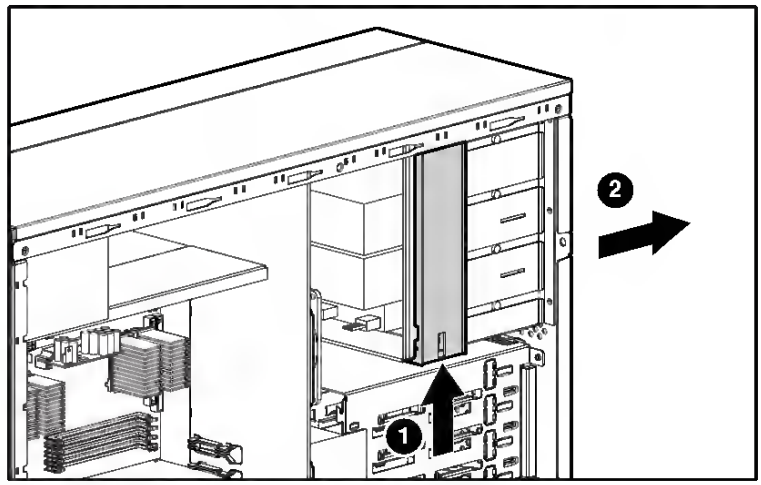

Figure 3-23. Releasing the tape drive

4. Remove the guide screws on the sides of the drive.
5. Install a hard drive blank into the empty drive bay.
6. Reinstall the access panel.

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Expansion Slots

Figure 3-24 and Table 3-2 identify the location of expansion slots.

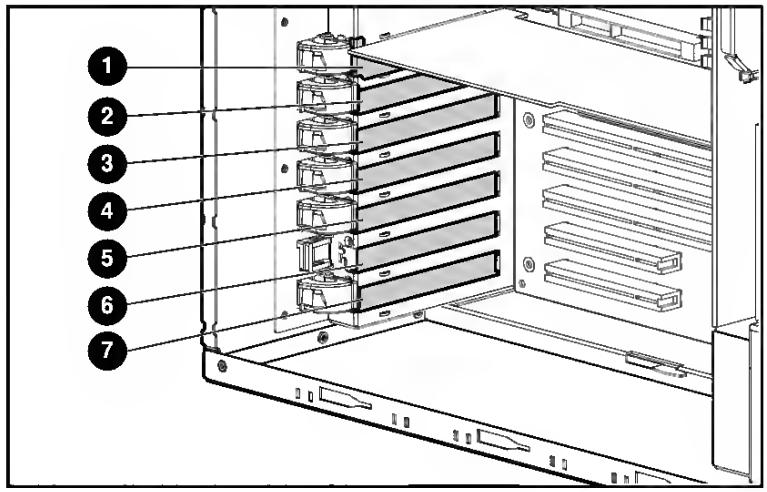

Figure 3-24. Locating expansion slots

Table 3-2
Expansion Slots

Item	Slot Type	Slot Number
❶	32-bit PCI (Server Feature Board)	1
❷	64-bit PCI	2
❸	64-bit PCI	3
❹	64-bit PCI	4
❺	64-bit PCI	5
❻	32-bit PCI	6
❼	32-bit PCI	7

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Installing and Removing an Expansion Board

To install an expansion board:

CAUTION: Before removing the access panel, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet.

IMPORTANT: It may be necessary to remove the slot cover next to the slot in which you are installing a card.

1. Follow the steps in "Removing the Access Panel" earlier in this chapter.
2. If an expansion board retainer is in place, loosen the thumbscrew ❶ of the expansion board retainer, then pull the retainer ❷ out and away from the chassis.

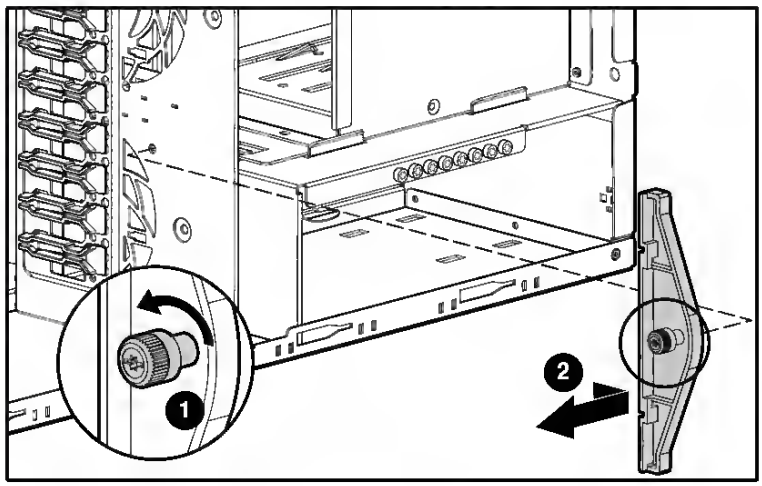

Figure 3-25. Removing the expansion board retainer

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3. Press on the top of the expansion slot latch ❶ and open the latch ❷ toward the rear of the chassis.
4. Remove the expansion slot cover ❸.

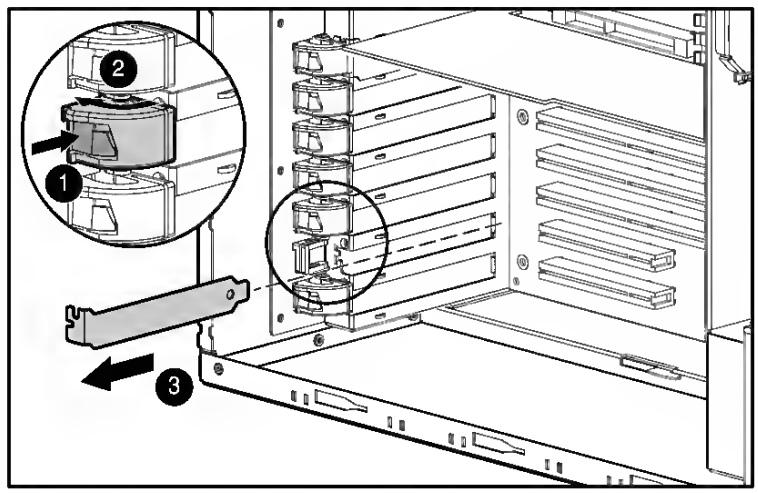

Figure 3-26. Removing the expansion slot cover

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IMPORTANT: Be sure to insert expansion boards into the appropriate type expansion slot. The 32-bit expansion boards must be inserted into 32-bit slots, and the 64-bit expansion boards must be inserted into 64-bit expansion slots.

5. Insert the expansion board ❶.
6. Close the expansion slot latch ❷ to secure the board.
7. Connect any cables to the expansion board.

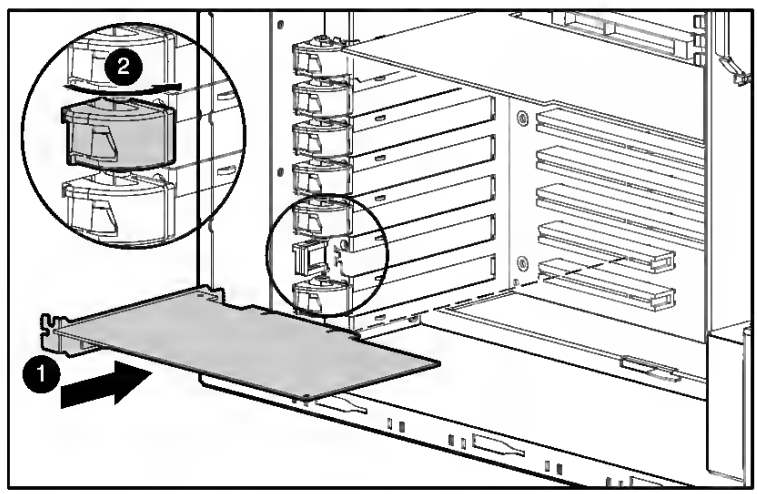

Figure 3-27. Installing an expansion board

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8. If needed, reinstall the expansion board retainer ❶ by placing it into the appropriate slot, then tighten the thumbscrews ❷.

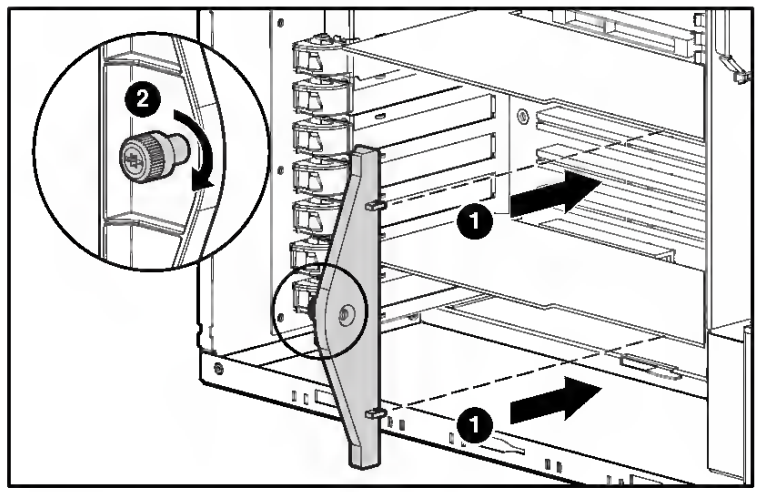

Figure 3-28. Reinstalling the expansion board retainer

9. Reinstall the access panel.

To remove an expansion board, reverse the above procedure.

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Memory Modules

Technical Information and Important Guidelines for DIMM Installation

When installing DIMMs, you must follow these guidelines:

- Use only 128-, 256-, 512-MB, or 1-GB PC 133-MHz Registered ECC SDRAM DIMMs.
- DIMMs must be industry-standard 168-pin PC 133-MHz or faster registered SDRAM DIMMs. The SDRAM DIMMs must support CAS Latency 2 or 3 (CL=2 or CL=3). They must also contain the mandatory Joint Electronic Device Engineering Council (JEDEC) Serial Presence Detect (SPD) information.
- Do not mix ECC and non-ECC SDRAM DIMMs. If different types of DIMMs are mixed, the system does not properly function.
- A DIMM can be installed only one way. Be sure to match the two *key slots* on the DIMM with the tab on the DIMM socket. Push the DIMM down into the DIMM socket, ensuring that it is fully inserted and properly seated.

CAUTION: When handling a memory module, be careful not to touch any of the contacts. Doing so may damage the module.

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Installing a Memory Module

The ProLiant ML350 supports PC 133-MHz Registered ECC SDRAM DIMMs. Additional DIMMs (128, 256, 512 MB, or 1 GB) are available to upgrade the memory. The server has four DIMM sockets located on the system board.

DIMMs do not need to be installed in pairs and can be installed in any sequence.

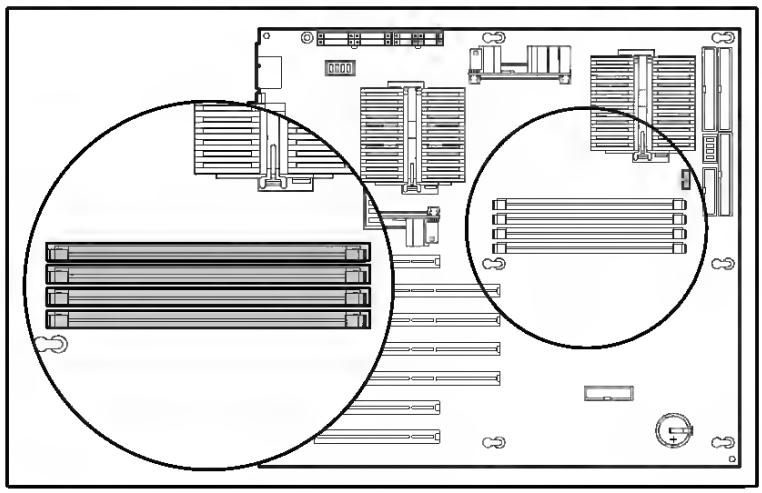

Figure 3-29. Locating DIMM sockets

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To install a DIMM:

1. Follow the steps in "Removing the Access Panel" at the beginning of this chapter.
2. Insert the DIMM into the socket ❶. Return latches ❷ to the upright position.

NOTE: The latches may automatically close when the DIMM is properly inserted.

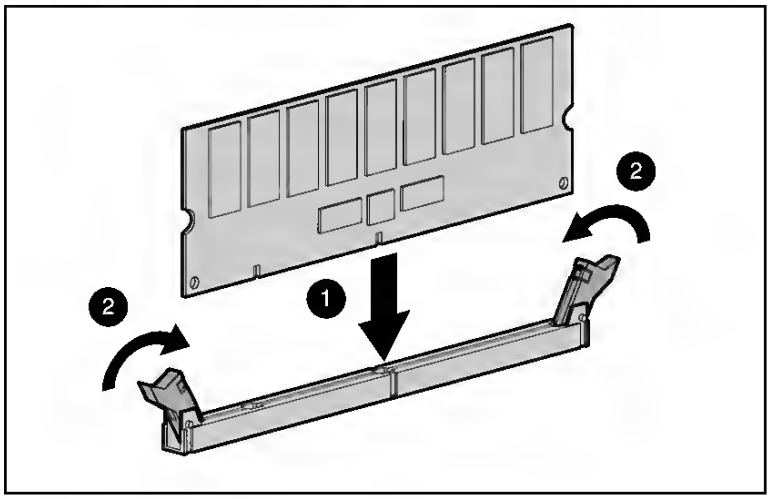

Figure 3-30. Installing a DIMM

3. Reinstall the access panel.

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Removing a Memory Module

To remove a DIMM:

> **CAUTION:** Before removing the access panel, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet.

1. Follow the steps in "Removing the Access Panel" at the beginning of this chapter.
2. Press outward on both latches ❶ of the DIMM socket at the same time. This step releases the DIMM and pushes it partially out of the socket.
3. Lift the DIMM ❷ from the socket.

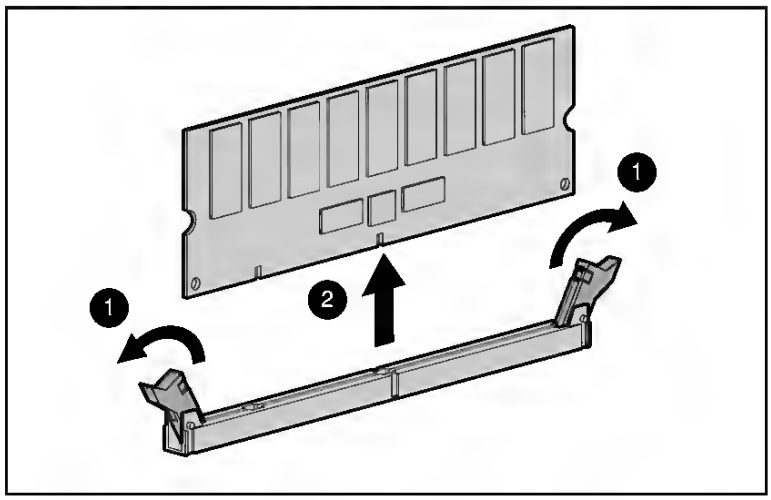

Figure 3-31. Removing a DIMM

4. Reinstall the access panel.

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Installing a Second Processor and Processor Power Module (PPM)

To install a second processor and PPM, refer to one of the following installation sources:

- For text and an illustrated procedure, refer to the installation documentation that came with the option kit.
- For an illustrated overview of the procedure, refer to the Quick Start Poster included in the shipping box or to the System Configuration Label located on the inside of the access panel.

IMPORTANT: The second processor must be the same speed as the first processor.

Installing a Second Processor

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching.

CAUTION: Before removing the access panel, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet.

1. Follow the steps in "Removing the Access Panel" at the beginning of this chapter.

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2. Locate the processor slots and Processor Power Module (PPM) sockets as shown in Figure 3-32 and Table 3-3.

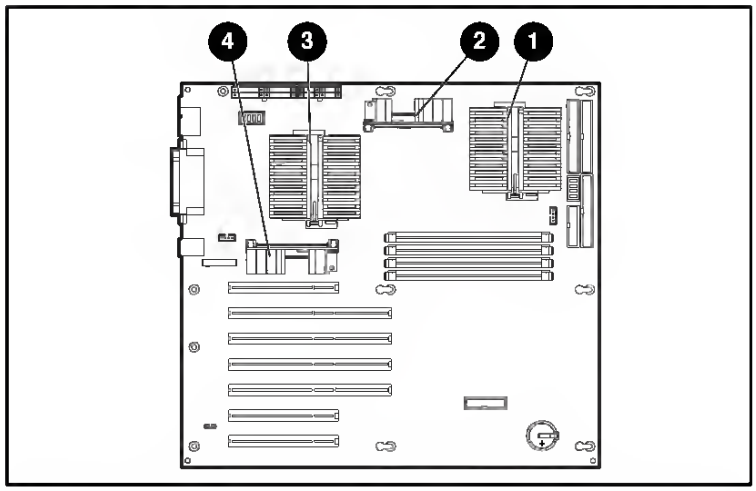

Figure 3-32. Locating the processor slots and Processor Power Module (PPM) sockets

Table 3-3
Processor Slots and Processor Power Module (PPM) Sockets

Item	Description
❶	Processor slot 1
❷	PPM socket 1
❸	Processor slot 2
❹	PPM socket 2

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3. Place the processor ❶ into the processor socket.

IMPORTANT: The small triangular directional marker should be in the upper left corner of the chip.

4. Lower the lever ❷ to lock the processor unit into place.
5. Secure the heatsink retainer clip ❸ to the hook on the processor.
6. Secure the opposite side of the heatsink retainer clip to the hook on the opposite side of the processor

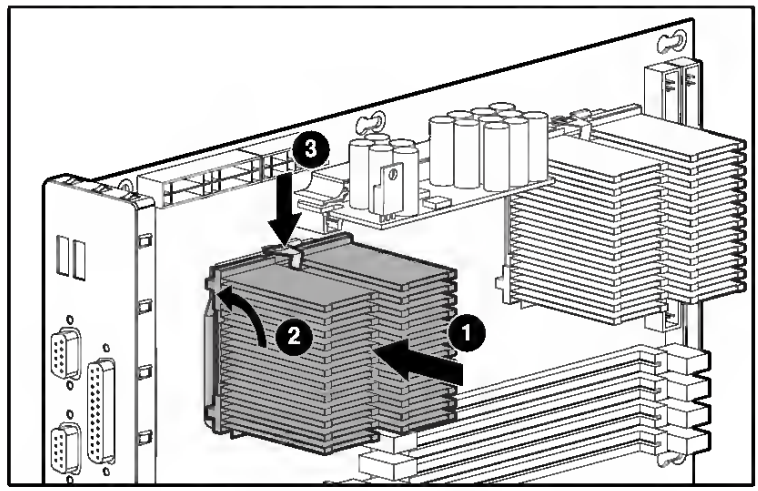

Figure 3-33. Installing the second processor

7. Install the PPMs before powering up the server. See "Installing a Second Processor Power Module (PPM)" later in this chapter.

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Installing a Second Processor Power Module (PPM)

Each Intel Pentium III processor supplied by Compaq comes with a Processor Power Module (PPM) (DC-to-DC converter). Each PPM must be installed into the slot adjacent to its processor to provide power to that processor. If the processor is installed into processor slot 1, install the PPM into PPM socket 1; if the processor is installed into processor slot 2, install the PPM into PPM socket 2. If two processors are installed, both PPMs must also be installed for proper operation. The PPM is keyed to ensure correct alignment. A notch in the bottom edge of the module, near the center, must align with a tab on the mounting bracket. The notch and tab will not line up if the module is turned the wrong way.

1. Align the PPM with the appropriate PPM socket.
2. Slide the PPM ❶ into the socket and close the latches ❷.

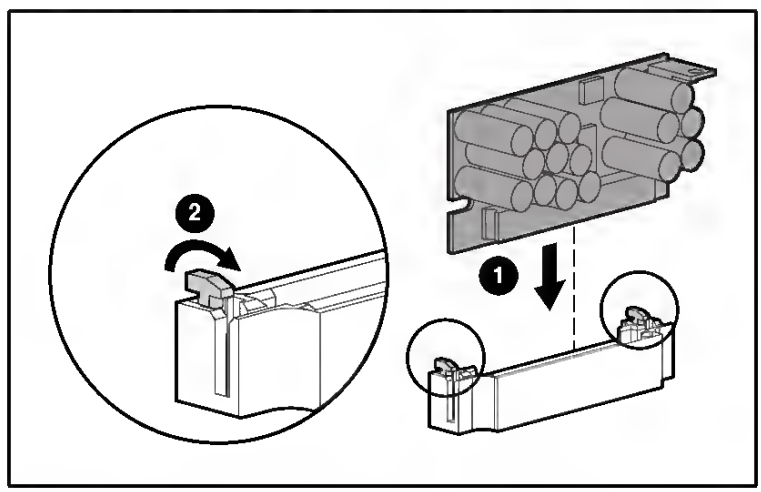

Figure 3-34. Installing a second Processor Power Module (PPM)

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Removing a Second Processor and Processor Power Module (PPM)

For an illustrated overview of this procedure, refer to the Quick Start Poster included in the shipping box or to the System Configuration Label located on the inside of the access panel.

Removing a Second Processor

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.

CAUTION: Do not remove the processor heatsink unless you are replacing the processor. When the heatsink is removed, its thermal seal to the processor is broken, and the thermal effectiveness of the heatsink is compromised. You must replace it with a new heatsink.

CAUTION: Before removing the access panel, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet.

1. Follow the steps in "Removing the Access Panel" at the beginning of the chapter.
2. Locate the processors and PPMs as shown in Figure 3-35 and Table 3-4.

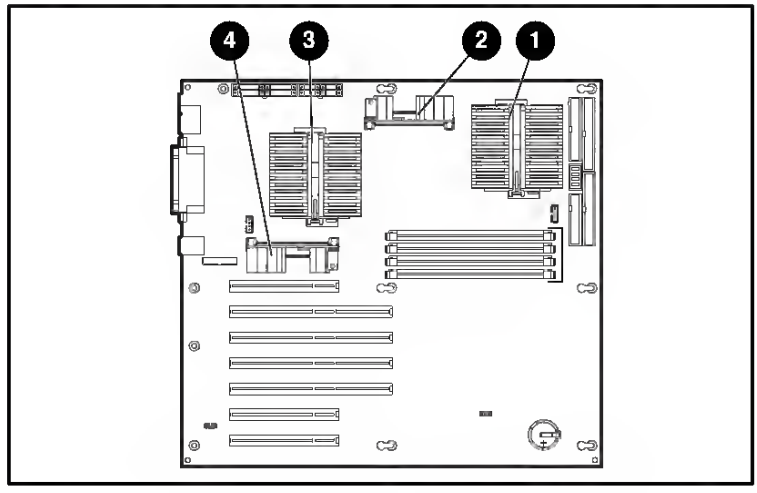

Figure 3-35. Locating the processors and Processor Power Modules (PPMs)

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Table 3-4
Processor and Processor Power Module (PPM) Locations

Item	Description
❶	Processor slot 1
❷	PPM socket 1
❸	Processor slot 2
❹	PPM socket 2

3. Press one side of the heatsink retainer clip to disengage the heatsink from the processor socket.
4. Unhook the opposite side of the heatsink retainer clip ❶ from the processor socket.
5. Lift up the lever ❷ on the processor socket until it releases.

IMPORTANT: The lever must be perpendicular to the system board to unlock the processor unit.

6. Remove the processor ❸ from the processor socket.

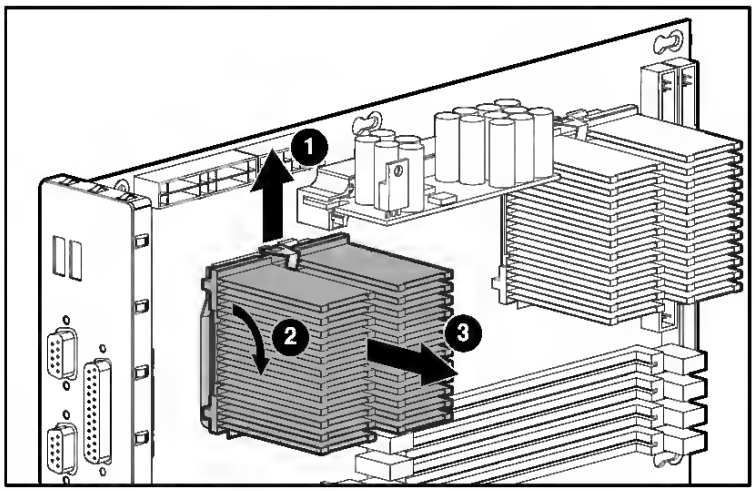

Figure 3-36. Removing the processor from the system board

7. Reinstall the access panel.

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Removing a Second Processor Power Module (PPM)

1. Open the latches ❶.
2. Remove the module ❷ from the socket on the system board.

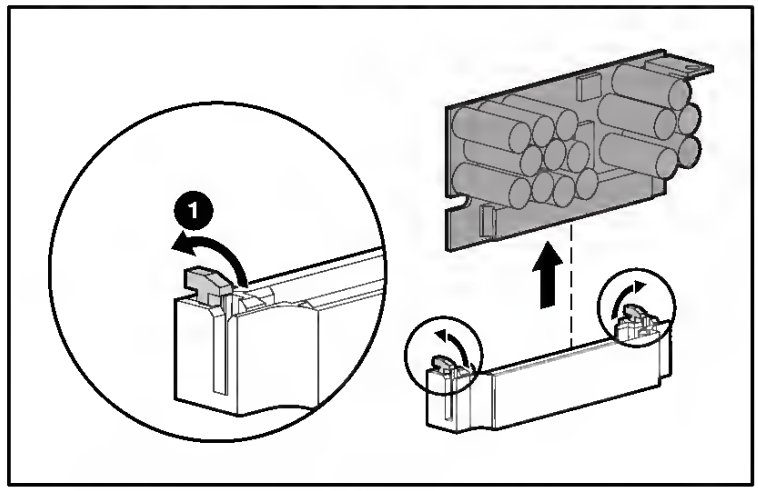

Figure 3-37. Removing the Processor Power Module (PPM)

Replacing the Battery

The ProLiant ML350 has nonvolatile memory that requires a battery to retain system information. There is a battery on the system board and a battery on the Server Feature Board. These batteries are required to maintain certain system data.

Replacing the Battery on the System Board

If your server no longer automatically displays the correct date and time, you may need to replace the battery that provides power to the real-time clock. When replacing a battery, use a CR2032 3-volt lithium coin cell battery.

After you have completed the battery installation, restart the system and run RBSU (**F9**) to reconfigure your system.

WARNING: The system board contains a lithium battery. There is a risk of fire and chemical burn if the battery is improperly handled. Do not disassemble, crush, puncture, short external contacts, dispose of in water or fire, or expose it to temperatures higher than 60°C (140°F).

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To replace the lithium battery:

CAUTION: Before removing the access panel, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet.

CAUTION: Static electricity can damage electronic components of the server. Before beginning these procedures, be sure you are discharged of static electricity by briefly touching a grounded (earthed) metal object.

1. Follow the steps in "Removing the Access Panel" at the beginning of this chapter.
2. Locate the battery on the system board.

NOTE: If you have expansion boards installed, you may need to remove them to access the battery.

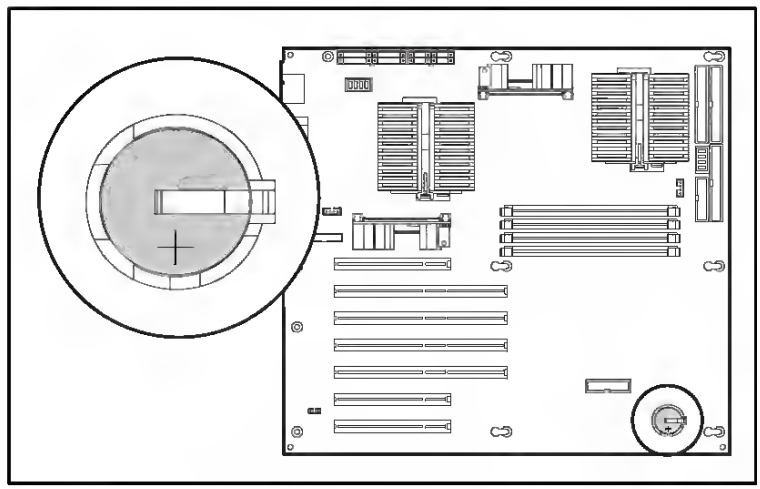

Figure 3-38. Locating the battery on the system board

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3. Slide the battery ❶ out of the holder. Lift the battery ❷ away from the holder.

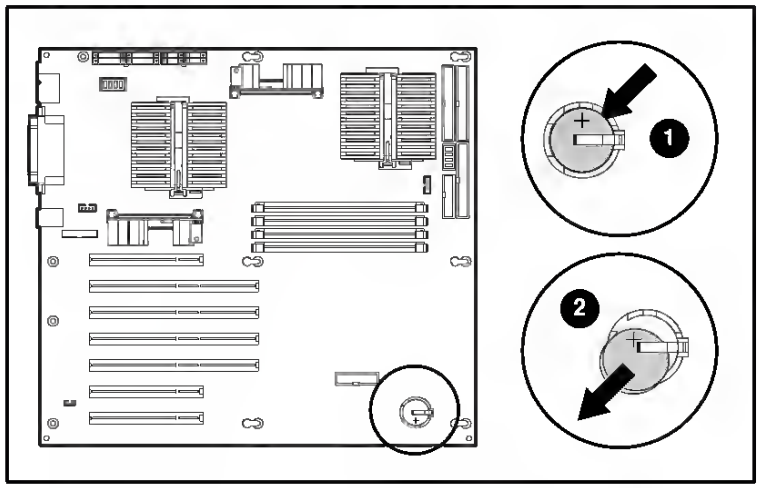

Figure 3-39. Removing the battery from the system board

4. Slide the replacement battery into the holder in the proper position.

IMPORTANT: Positive polarity (+) should be positioned facing out.

5. Reinstall the access panel.
6. Run the ROM Based Setup Utility (RBSU) to reconfigure your system.

Replacing the Battery on the Server Feature Board

WARNING: The system board contains a lithium battery. There is a risk of fire and chemical burn if the battery is improperly handled. Do not disassemble, crush, puncture, short external contacts, dispose of in water or fire, or expose it to temperatures higher than 60°C (140°F).

CAUTION: Before removing the access panel, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet.

CAUTION: Static electricity can damage electronic components of the server. Before beginning these procedures, be sure you are discharged of static electricity by briefly touching a grounded (earthed) metal object.

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To install the new battery:

NOTE: It may be necessary to remove the Server Feature Board from the unit to replace the battery. Refer to "Expansion Slots" earlier in this chapter for instructions on removing and installing expansion boards (including the Server Feature Board).

1. Follow the steps in "Removing the Access Panel" at the beginning of the chapter.
2. Slide the battery out of the holder.

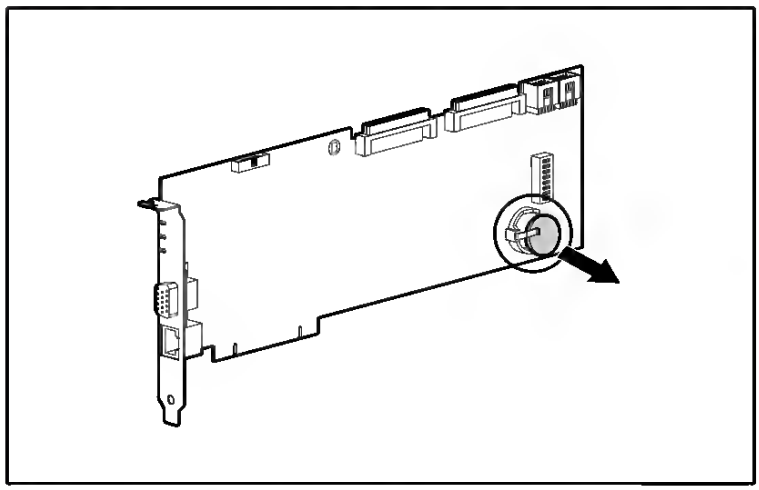

Figure 3-40. Removing the battery from the Server Feature Board

3. Slide the replacement battery into the proper position.

IMPORTANT: Positive polarity (+) must be positioned facing out.

4. Replace the server access panel and connect cables to the server.
5. Run RBSU to reconfigure your system after restarting by pressing **F9** when prompted in the lower right corner of the screen.

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Chapter 4

Cabling Guidelines

Storage Device Installation Guidelines

This chapter provides an overview of the internal cabling of the ProLiant ML350 chassis. It also includes information on how to cable SCSI, IDE, and removable media devices in the system, as well as information about all critical system cabling. If external cabling is required, please refer to the documentation included with your external storage option device.

Consider the following guidelines when adding SCSI devices:

- As a general rule, a maximum of seven devices may be added per channel. Your server is equipped with two Wide-Ultra3 SCSI channels.
- The configuration settings on each SCSI device should be set to the SCSI ID of the bay (Bay 0 = SCSI ID 0) that it will occupy.
- If only one SCSI hard drive is used, it should be installed in the lowest-numbered bay (0).
- Be sure to remove all terminating jumpers from third-party SCSI devices.

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Identifying the Internal SCSI Components

Non-Hot-Plug Hard Drive SCSI Cable

The SCSI cable shown in Figure 4-1 is included with the non-hot-plug hard drive server. The SCSI cable shown in this illustration supports up to four SCSI devices and includes a terminator on the end.

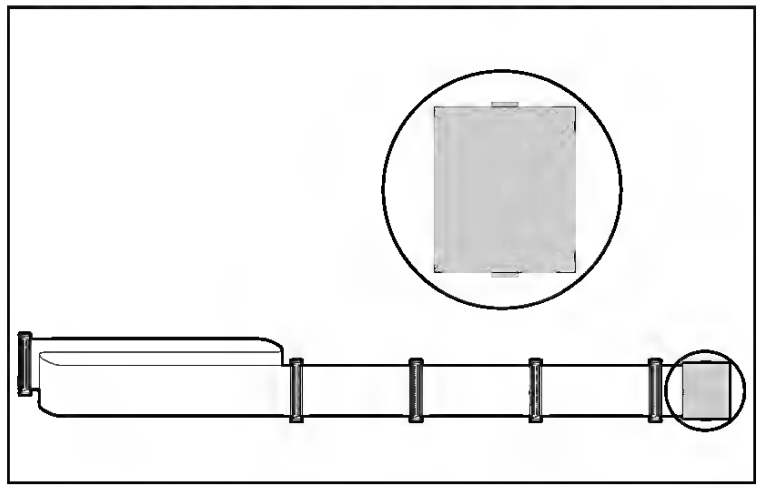

Figure 4-1. Identifying the non-hot-plug SCSI cable with terminator

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Hot-Plug Hard Drive SCSI Cable

The SCSI cable shown in Figure 4-2 is included with the hot-plug hard drive server. The SCSI cable shown in this illustration connects the hot-plug drive cage to the SCSI controller. The hot-plug hard drive cage has built-in termination.

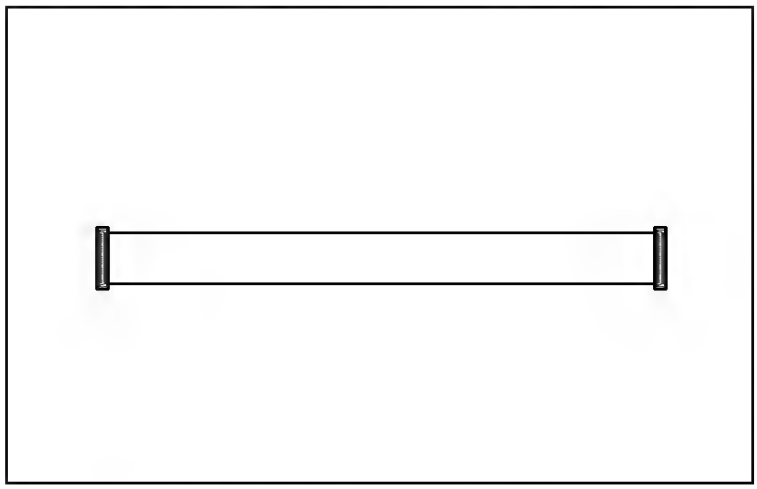

Figure 4-2. Identifying the hot-plug hard drive SCSI cable

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Internal SCSI Component Location

Before cabling the server, note the removable media and hard drive cage locations as shown in Figure 4-3 and Table 4-1. For additional information about installing optional SCSI devices, refer to the documentation included with the SCSI devices.

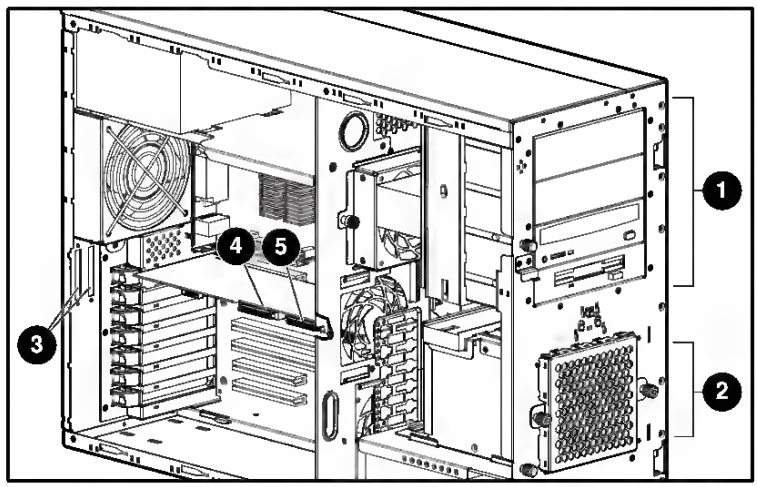

Figure 4-3. Internal SCSI components

Table 4-1
Internal SCSI Component Locations

Number	Description
❶	Removable media area
❷	Hard-drive cage
❸	SCSI knockouts
❹	SCSI channel B connector
❺	SCSI channel A connector

NOTE: The interior of the server may look different depending on the model purchased.

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Identifying and Connecting a Fast SCSI-2 Device (Narrow)

Some SCSI devices require a special adapter to connect with the SCSI cable included with your server.

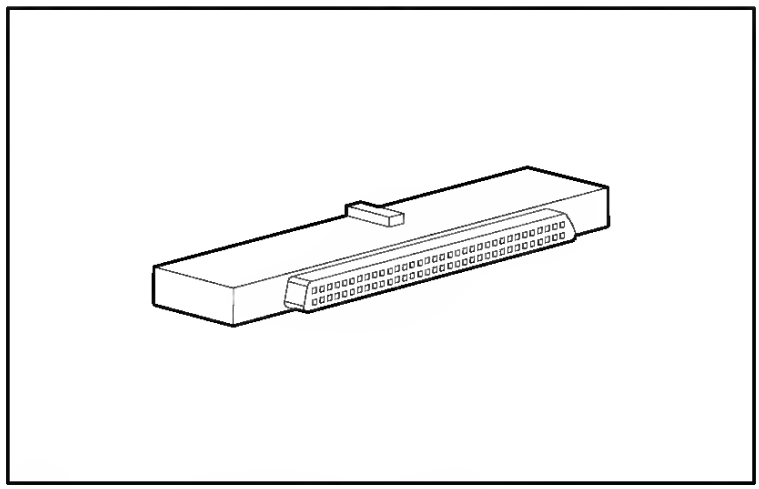

Figure 4-4. 68-to-50 pin (wide-to-narrow) SCSI adapter

If you are installing a device that uses a Fast SCSI-2 interface, you must use a 68-to-50 pin SCSI adapter (spare part number 199618-001) shown in Figure 4-4. This adapter should be installed between the 50-pin interface of the device and the 68-pin SCSI cable connected to the SCSI connector of the system.

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Connecting an Integrated Wide-Ultra3 SCSI Controller to an Internal Non-Hot-Plug Hard Drive

The following steps detail the procedure for cabling an integrated Wide-Ultra3 SCSI controller (channel A) to an internal non-hot-plug hard drive:

1. Follow the steps in the sections following "Installation and Removal Guidelines for SCSI Hard Drives" in Chapter 3.
2. Make sure the SCSI ID is uniquely set on each device.
3. Install the next available SCSI connector ❶ to the hard drive.
4. Install the next available power connector ❷ to the hard drive.

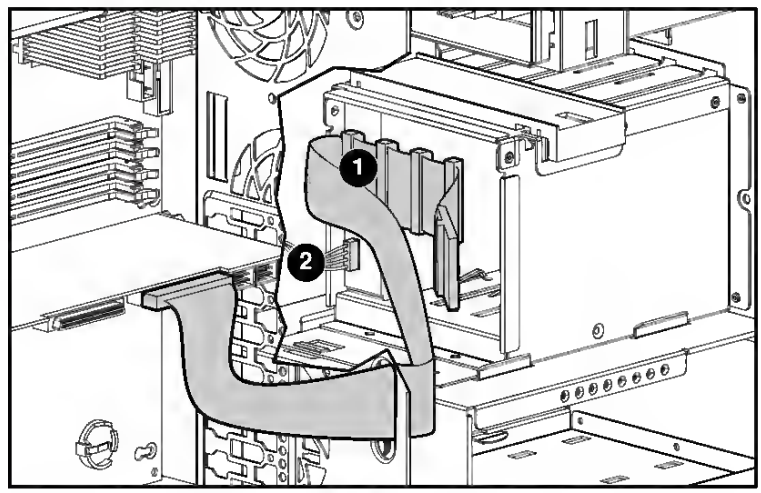

Figure 4-5. Cabling an integrated Wide-Ultra3 SCSI controller to an internal non-hot-plug hard drive

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Connecting an Integrated Wide-Ultra3 SCSI Controller to a Removable Media or Other Device

The following steps detail the procedure for cabling an integrated Wide-Ultra3 SCSI controller (channel B) to a removable media or other device:

1. Follow the steps in the sections following "Installing a Device in a Removable Media Device Bay" in Chapter 3. Make sure the SCSI ID is uniquely set on each device.
2. Locate the SCSI cable that is attached to SCSI channel B.
3. Install the next available connector ❶ to the device.
4. Install the next available power connector ❷ to the device.

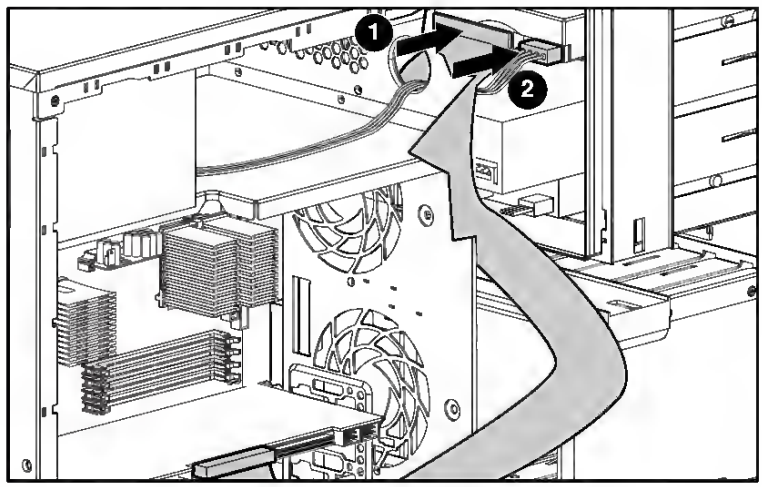

Figure 4-6. Cabling an integrated Wide-Ultra3 SCSI controller to a removable media or other device

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Connecting Internal Hard Drives to a SCSI Controller Option or Smart Array Controller

Many configurations are possible when adding SCSI controllers. This section outlines the procedure for connecting internal hard drives to a SCSI controller option or a Smart Array Controller and assumes that the controller option or Smart Array Controller is already installed.

1. If hard drives are not already installed, follow the steps in the sections "Installation and Removal Guidelines for SCSI Hard Drives" and "Expansion Slots" in Chapter 3.
2. Locate the SCSI cable that is connected to the Server Feature Board SCSI controller channel A.

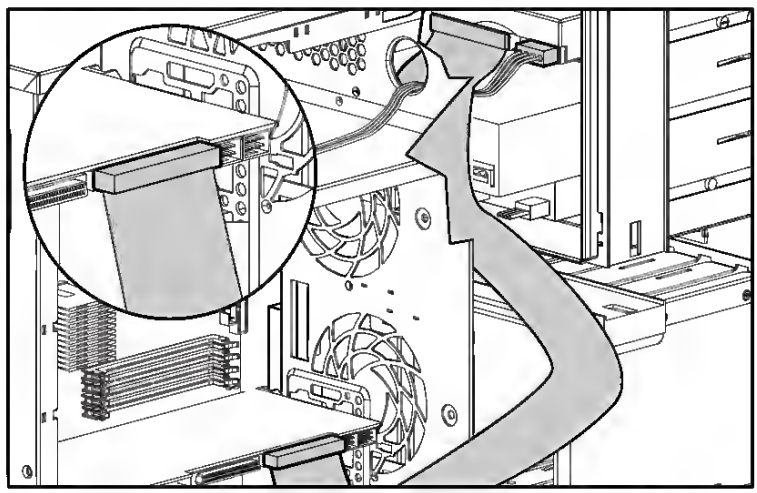

Figure 4-7. Locating the SCSI cable (SCSI channel A)

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3. Remove the SCSI cable from the SCSI channel A connector on the system board.
4. Reconnect the SCSI cable to either the SCSI Controller option or Smart Array Controller.

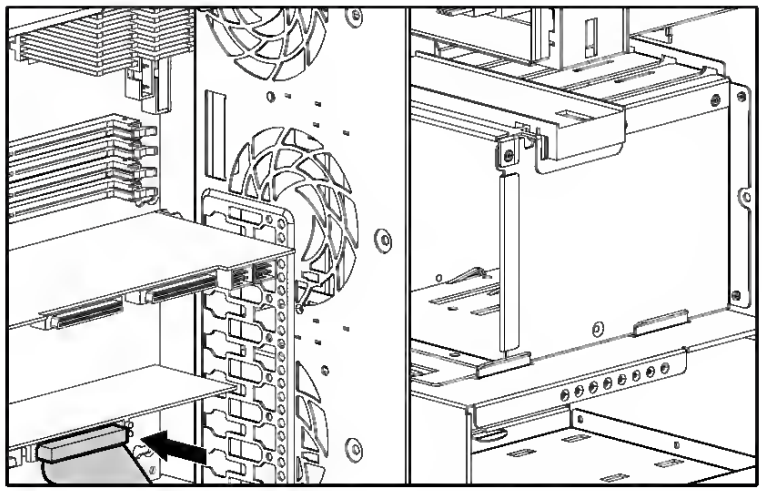

Figure 4-8. Connecting a SCSI cable to a SCSI controller option or Smart Array Controller

NOTE: Both SCSI channels on the Server Feature Board are self-terminating. If you choose to not use one or both of the SCSI channels, you do not need to terminate the unused channel(s).

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Installing an Internal to External SCSI Connector

If you are not using one or both SCSI channels (A or B) internally, you may install an internal to external SCSI connector in the SCSI knockout locations on the rear of the chassis. To install an internal to external SCSI connector, follow the steps below:

1. Using a Torx T-15 screwdriver, remove the screw ❶ holding the SCSI knockout cover plate and remove the cover plate ❷.
2. Insert the SCSI connector ❸ into the open area. Secure the external SCSI connector ❹ to the chassis using the screws provided with the external SCSI connector option kit.

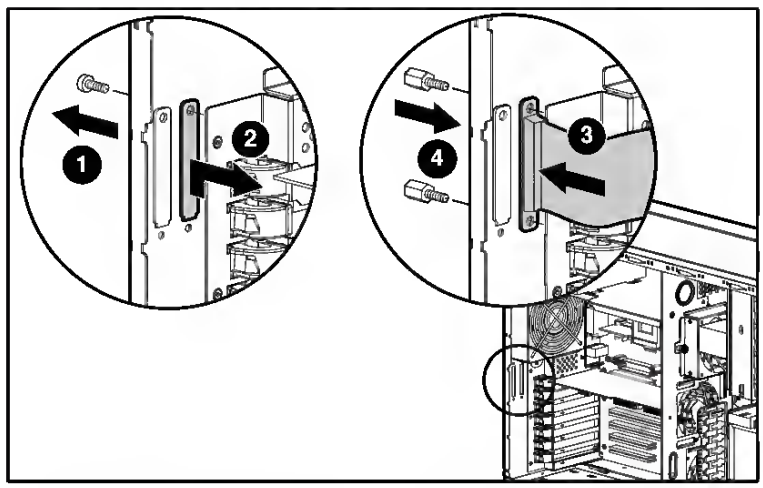

Figure 4-9. Installing an internal to external SCSI connector

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3. Secure the internal to external SCSI connector cable to either internal SCSI channel (A or B).

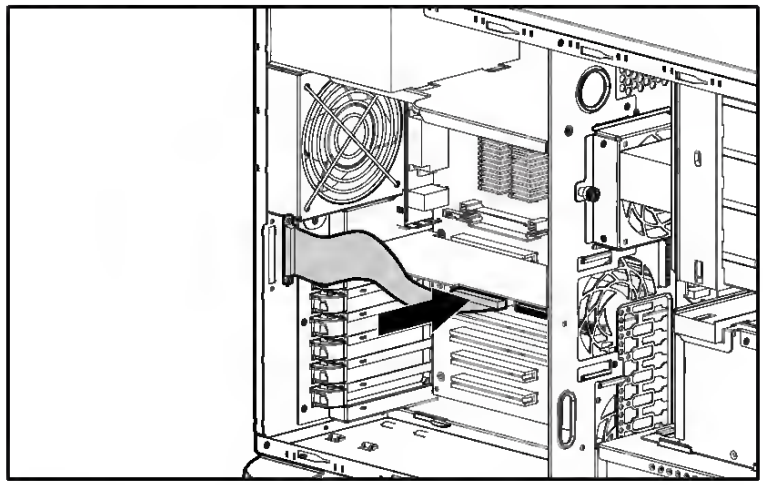

Figure 4-10. Connecting the cable to Server Feature Board SCSI channel B

NOTE: The interior of the server may look different depending on the model purchased.

Connecting IDE Devices to the Integrated IDE Controller

Your server includes one IDE cable (the Cable Select Cable) that can connect up to two IDE devices to the system through the integrated IDE controller. This cable has three clearly labeled connectors. If only one IDE device is connected to the system, it must be secured to the cable connector labeled Drive 0. All IDE devices in the system should have their configuration jumpers set to "Cable Select" or "CS."

IMPORTANT: If your network operating system is Novell NetWare, Compaq recommends that you connect your CD-ROM to the primary IDE channel and to the Drive 0 connector on the IDE cable.

NOTE: IDE hard drives are not supported.

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Connecting the Server Management Information Cable (SMIC)

The Server Management Information Cable (SMIC) provides system critical management information to the operating system. Proper SMIC cabling helps to avoid potential system failure and BIOS error messages. Figure 4-11 illustrates the proper SMIC connection between the system board and the Server Feature Board.

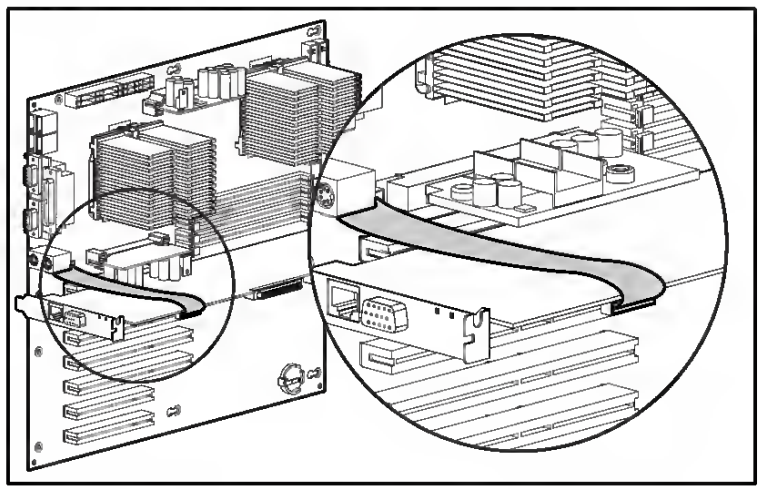

Figure 4-11. Connecting the Server Management Information Cable (SMIC)

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Connecting the System Fan

The system fan is an integral part of the ProLiant ML350 system design. Proper cabling of the fan helps to avoid potential system failure and operating system error messages.

Connect the system fan to the system board as illustrated in Figure 4-12.

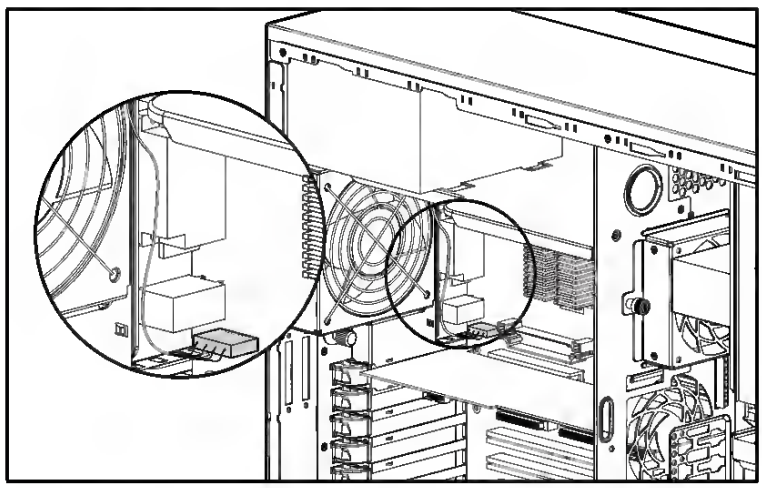

Figure 4-12. Connecting the system fan

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Chapter 5

Server Configuration and Utilities

This chapter provides information about the utilities and tools provided with the ProLiant ML350. The following tools and utilities are described:

- ROM Based Setup Utility (RBSU)
- ROMPaq Utility
- SmartStart and Support Software CD
- SmartStart Diskette Builder
- Compaq Insight Manager
- Compaq Survey Utility
- Compaq Diagnostics Utility
- Automatic Server Recovery (ASR)

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ROM Based Setup Utility (RBSU)

RBSU performs a wide range of configuration activities including the following:

- Configuring system devices and installed options
- Viewing system information
- Selecting the operating system
- Selecting the primary boot controller
- Managing storage options

In addition, RBSU includes other features, which are outlined in "Using the ROM Based Setup Utility (RBSU)" later in this chapter.

Navigating the ROM Based Setup Utility (RBSU)

To make selections within RBSU, use the following keys:

- To access RBSU press **F9** during power up when prompted in the lower right corner of the screen.
- The **Arrow** keys navigate through the menu system.
- Selections are made by pressing **Enter**.
- Selections are cancelled by pressing the **Escape** key.
- Selections and changes are saved by pressing **F10.**

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Using the ROM Based Setup Utility (RBSU)

NOTE: Most of the features in RBSU are not required in the setup of your server. The options in this utility are designed to assist with specific server configuration issues.

RBSU is separated into a series of menu selections designed to configure specific areas of the system. The primary menus are as follows:

- System Options
- PCI Devices
- Boot Controller Order
- Date and Time
- System Passwords
- System Identification
- Advanced Options
- Utility Language

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System Options

The System Options menu is used for overall system configuration settings. The following is a list of selections found in this menu with an explanation of each option:

OS Selection allows the selection of the operating system. This option automatically selects appropriate advanced settings for the operating system selected and should be set before the operating system installation.

Embedded COM Port A allows the user to enable the embedded COM Port A at the specified resource settings or disable the option.

Embedded COM Port B allows the user to enable the embedded COM Port B at the specified resource settings or disable the option.

Embedded LPT Port allows the user to enable the embedded LPT Port at the specified resource settings or disable the option.

Standard Boot Order allows the user to configure the order of devices used to start an operating system. This feature is used to prevent the system from starting from diskette and CD, and to select which device the system scans first.

Diskette Write Control allows the user to configure the write control of the removable media drive. It can be set to read and write or to read only.

Diskette Boot Control allows the user to have the system boot for the removable media device.

PCI Devices

The PCI Devices menu option is used to view and assign the IRQs for all PCI devices.

Boot Controller Order

The Boot Controller Order menu option is used to view and assign the current controller order.

Date and Time

The Date and Time menu option is used to set the system date and time.

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System Passwords

The System Passwords menu is used to set up passwords to limit access to the system and its setup options. The following is a list of selections found in this menu with an explanation of each option:

Setup Password allows a setup password to be set. This password is used to keep unauthorized users from modifying the setup options.

Power-On Password allows a power-on password to be set. This password is used to keep unauthorized users from powering on the system.

Network Server Mode allows the user to disable or enable the ability to start the system with a locked keyboard or without a keyboard. The keyboard is unlocked by entering the Power-On Password.

System Identification

The System Identification menu is used to identify the system.

Asset Tag allows the user to identify the system with an Asset Tracking Number.

Advanced Options

The Advanced Options menu is used to configure advanced options of the system. The following is a list of selections found in this menu with an explanation of each option:

MPS Table Mode allows the user to change the APIC table setting. This selection should be automatically set by OS Selection, but it allows the user to override the automatic selection.

Post Speed Up allows the user to enable or disable the quick or slow start process. The slow start process performs a complete memory test.

Automatic Server Recovery allows the user to enable or disable the Automatic Server Recovery option.

Wake Support (PME) allows the user to enable or disable Wake Support (PME).

Floppy Controller allows the user to enable or disable the floppy controller.

Primary IDE Controller allows the user to enable or disable the primary IDE controller.

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Secondary IDE Controller allows the user to enable or disable the secondary IDE controller.

Processor Serial Number allows the user to enable or disable the ability of applications to read the processor serial number.

NMI Debug Button allows the user to enable or disable the NMI Debug Button. (This button is located on the Server Feature Board and is disabled as the default setting.)

Thermal Shutdown allows the user to disable or enable the ability of the system to shutdown due to a thermal caution event. The default for this option is enabled. Compaq does not recommend disabling this feature.

Set Default Configuration allows the user to reset the configuration settings to their factory defaults.

Utility Language

The Utility Language is used to set the language in which RBSU displays. The user has the following choices:

- English
- Spanish
- German
- French
- Italian
- Japanese

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ROMPaq Utility

Using Flash ROM in Compaq servers allows the firmware (BIOS) to be upgraded with system or option ROMPaq utilities. To upgrade the BIOS, insert a ROMPaq diskette into drive A and power up the system.

The ROMPaq Utility then checks the system and provides a choice (if more than one exists) of ROM revisions to which the system can be upgraded. This procedure is the same for both system and option ROMPaq utilities.

CAUTION: Do not power down during a firmware upgrade. A loss of power during upgrade may corrupt the firmware and prevent the system from starting.

SmartStart and Support Software CD

The SmartStart and Support Software CD is used to load the system software, thereby achieving a well-integrated server and ensuring maximum dependability and supportability. The SmartStart CD contains diagnostic utilities and ROMPaq tools.

IMPORTANT: Do not use the SmartStart and Support Software CD for loading system software if you purchased your system with a factory-installed operating system. Refer to the *Compaq Factory-Installed Operating System Software User Guide* for software installation guidelines.

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SmartStart Diskette Builder

The SmartStart and Support Software CD contains a utility to generate support diskettes in the event they are needed or the software cannot be used directly from the SmartStart and Support Software CD. Support diskettes are "punched-out" from data stored on the SmartStart and Support Software CD. The support includes:

- Array Configuration Utility
- Operating System support
- Diagnostic utilities
- Server utilities
- Erase utility
- System and Option ROMPaq diskettes

To run the Diskette Builder, use a workstation running Microsoft Windows 95, Windows 98, Windows NT, or Windows 2000. You also need several 1.44-MB diskettes. All data on the diskettes will be overwritten. Insert the SmartStart and Support Software CD in the workstation drive. The CD automatically runs the Diskette Builder utility; however, if the system does not support the "auto-run" feature, use Windows Explorer to run [CD-ROM DRIVE]:\DSKBLDR\DSKBLDR.EXE.

Compaq Insight Manager

Compaq Insight Manager is the Compaq application for easily managing network devices. Compaq Insight Manager delivers intelligent monitoring and alerting as well as visual control of your Compaq devices. Documentation for Compaq Insight Manager is available on the Compaq Management CD in [CD-ROM DRIVE]:*OVERVIEW.HLP*.

IMPORTANT: You must install and use Compaq Insight Manager to benefit from the Compaq pre-failure warranties on processors, hard drives, and memory modules.

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Compaq Survey Utility

The Compaq Survey Utility is an online information-gathering agent that runs on servers, gathering critical hardware and software information from various sources.

The Compaq Survey Utility outputs the information it gathers into *SURVEY.TXT*. This file is located in [Windows NT Drive]:\COMPAQ\SURVEY for Windows NT, and SYS:SYSTEM for NetWare. If a significant change occurs between data gathering intervals, the previous information is marked, and *SURVEY.TXT* is overwritten to reflect the latest configuration and changes. This file allows you to keep a historical record of change events for server hardware and software.

The Compaq Survey Utility automatically runs at power-up and on specified time intervals. You can modify the data-gathering interval by modifying the command line parameters.

Installing Survey

Installing Survey with SmartStart Installation

To install the Compaq Survey Utility through the SmartStart Setup process, refer to the SmartStart Installation poster. This method installs an operating system and Compaq products on a server. Do not use this method to add the Compaq Survey Utility to an existing system.

Installing Survey from Compaq Management CD

To install the Compaq Survey Utility from the Compaq Management CD on a Windows NT server, you must be logged on to the Windows NT server with administrator access rights. Once you are logged on, enter the following at the Windows NT command prompt:

```
[CD-ROM DRIVE]:\Survey\Win-NT\Eng\Survey -i -c
```

If the target server does not have a CD drive, use Diskette Builder to create Survey utility diskettes.

To install the Compaq Survey utility from the Compaq Management CD on a NetWare server, enter the following at the NetWare system prompt:

```
Load [CD-ROM DRIVE]:\Survey\Netware\Eng\Sinstall
```


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Running Survey

Once the Compaq Survey Utility is installed, it gathers information by default every Wednesday at noon and at every power-up. You can change the Compaq Survey Utility data-gathering interval using command line parameters. You can also force a one-time, immediate collection.

If you want the Compaq Survey Utility to perform a one-time immediate collection on a Windows NT server, enter the following at the Windows NT command prompt: **Survey**

If you want the Compaq Survey Utility to perform a one-time immediate collection on a NetWare server, you need to unload the utility, then reload it. Enter the following at the NetWare system prompt: **Unload Survey**

At the next NetWare system prompt, enter the following: **Load Survey**

You can also change the Compaq Survey Utility data-gathering interval using command line parameters.

Compaq Diagnostics Utility

The Diagnostics Utility is accessed from diskette. A diskette can be created from the SmartStart CD. To run Diagnostics, insert the Diagnostics diskette and restart the server. The server powers up from the diskette and runs the Diagnostics Utility.

Automatic Server Recovery (ASR)

ASR is a feature in ProLiant servers that causes the system to restart in the event of a catastrophic OS error like a blue-screen, ABEND (abnormal end), or panic. A system fail-safe timer, the ASR timer, is started when the Compaq System Management driver, also known as the health driver, is loaded. The timer is periodically reset during normal OS operation, but in the event of OS failure, the timer expires and restarts the server. ASR increases server up time by restarting the server within 10 minutes after a crash or system hang. The Compaq Insight Manager console notifies you in the event of a server ASR. You can disable ASR from the Compaq Insight Manager console or RBSU.

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Appendix A

Regulatory Compliance Notices

Regulatory Compliance Identification Numbers

For the purpose of regulatory compliance certifications and identification, your server is assigned a Compaq series number. The Compaq series number for the ProLiant ML350 is Series ES1007. The series number can be found on the product label, along with the required approval markings and information. When requesting certification information for this product, always refer to this series number. This series number should not be confused with the marketing name or model number for your server.

Communications Commission Notice

Part 15 of the Federal Communications Commission (FCC) Rules and Regulations has established Radio Frequency (RF) emission limits to provide an interference-free radio frequency spectrum. Many electronic devices, including computers, generate RF energy incidental to their intended function and are, therefore, covered by these rules. These rules place computers and related peripheral devices into two classes, A and B, depending upon their intended installation. Class A devices are those that may reasonably be expected to be installed in a business or commercial environment. Class B devices are those that may reasonably be expected to be installed in a residential environment (personal computers, for example). The FCC requires devices in both classes to bear a label indicating the interference potential of the device as well as additional operating instructions for the user.

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The rating label on the device shows which class (A or B) the equipment falls into. Class B devices have an FCC logo or FCC ID on the label. Class A devices do not have an FCC logo or FCC ID on the label. Once the class of the device is determined, refer to the following corresponding statement.

Class A Equipment

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at personal expense.

Class B Equipment

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause barmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

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Declaration of Conformity for Products Marked with the FCC Logo - United States Only

This device complies with Part 15 of the FCC Rules Operation and is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For questions regarding your product, contact:

Compaq Computer Corporation
P. O. Box 692000, Mail Stop 530113
Houston, Texas 77269-2000

Or, call

1-800-652-6672 (1-800-OK COMPAQ). For continuous quality improvement, calls may be recorded or monitored.

For questions regarding this FCC declaration, contact:

Compaq Computer Corporation
P. O. Box 692000, Mail Stop 510101
Houston, Texas 77269-2000

Or, call

(281) 514-3333

To identify this product, refer to the Part, Series, or Model number found on the product.

Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Compaq Computer Corporation may void the user's authority to operate the equipment.

Cables

Connections to this device must be made with shielded cables with metallic RFI/EMI connector hoods in order to maintain compliance with FCC Rules and Regulations.

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Canadian Notice (Avis Canadien)

Class A Equipment

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Class B Equipment

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

European Union Notice

Products with the CE Marking comply with both the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European Norms (in brackets are the equivalent international standards):

- EN55022 (CISPR 22) - Electromagnetic Interference
- EN50082-1 (IEC801-2, IEC801-3, IEC801-4) - Electromagnetic Immunity
- EN60950 (IEC950) - Product Safety

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Japanese Notice

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Taiwanese Notice

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Battery Replacement Notice

Your computer is provided with a lithium manganese dioxide battery. There is a danger of explosion and risk of personal injury if the battery is incorrectly replaced or mistreated. For more information about battery replacement or proper disposal, contact your Compaq authorized reseller or authorized service provider.

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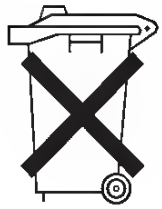
WARNING: Your computer contains an internal lithium manganese dioxide battery. There is risk of fire and burns if the battery pack is not handled properly. To reduce the risk of personal injury:

- Do not attempt to recharge the battery.
- Do not expose to temperatures higher than 60°C.
- Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.
- Replace only with the Compaq spare designated for this product.



Batteries, battery packs, and accumulators should not be disposed of together with the general household waste. In order to forward them to recycling or proper disposal, use the public collection system or return them to Compaq, your Compaq authorized service resellers or providers, or their agents.

Laser Compliance

The CD-ROM drive contains a laser diode of gallium aluminum arsenide (GaAlAs) emitting in the wavelength range of 780 +/- 35 nm. All Compaq systems equipped with a laser device comply with safety standards, including International Electrotechnical Commission (IEC) 825. With specific regard to the laser, the equipment complies with laser product performance standards set by government agencies as a Class 1 laser product. The product does not emit hazardous laser radiation.

WARNING: Use of controls or adjustments or performance of procedures other than those specified herein or in the laser product's installation guide may result in hazardous radiation exposure. To reduce the risk of exposure to hazardous radiation:

- Do not try to open the unit enclosure. There are no user-serviceable components inside.
- Do not operate controls, make adjustments, or perform procedures to the laser device other than those specified herein.
- Allow only Compaq authorized service providers to repair the unit.

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The Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration implemented regulations for laser products on August 2, 1976. These regulations apply to laser products manufactured from August 1, 1976. Compliance is mandatory for products marketed in the United States.

This marking on the internal CD-ROM drive indicates that the product is classified as a CLASS 1 LASER PRODUCT.

Power Cords

If you were not provided with a power cord for your computer, you should purchase a power cord that is approved for use in your country.

The power cord must be rated for the product and for the voltage and current marked on the product electrical ratings label. The voltage and current rating of the cord should be greater than the voltage and current rating marked on the product. In addition, the diameter of the wire must be a minimum of 1.00 mm^2 or 18AWG, and the length of the cord must be between 1.8 m (6 ft) and 3.6 m (12 ft). If you have questions about the type of power cord to use, contact your Compaq authorized service provider.

A power cord should be routed so that it is not likely to be walked on or pinched by items placed upon it or against it. Particular attention should be paid to the plug, electrical outlet, and the point where the cord exits from the product.

Mouse Compliance Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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Appendix B

Electrostatic Discharge (ESD)

To prevent damaging the system, be aware of the precautions you need to follow when setting up the system or handling parts. An electrostatic discharge (ESD) from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

To prevent electrostatic damage, observe the following precautions:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded (earthed) surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

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Grounding Methods

There are several methods for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded (earthed) workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm ± 10 percent resistance in the ground cords. To provide proper grounding, wear the strap snug against the skin.
- Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, have a Compaq authorized reseller install the part.

NOTE: For more information on static electricity, or assistance with product installation, contact your Compaq authorized reseller.

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Appendix C

Switches and Jumpers

When you add or remove a component or change a security feature, you must reconfigure the server to recognize these changes. If the system configuration is incorrect, your server may not properly work and you may receive error messages on the screen. Setting the system board switches is part of the reconfiguration process, along with running RBSU.

Setting System Board Switches

The ProLiant ML350 system board has a four-position switch (SW1) that is used to set configuration settings on your server. For information on settings, refer to the access panel labels, to the *Compaq ProLiant ML350 Quick Start Poster*, or to Table C-1 and Table C-2.

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System Board Configuration Switch Settings (SW1)

The following table defines the function for each system board configuration switch setting (SW1):

Table C-1
System Board Configuration Switch Settings (SW1)

Switch	Function	Default Position
1	On = Clear setup password	Off
2	On = Clear stored configuration data	Off
3	On = Rack Off = Tower	Off
4	On = BIOS disaster recovery Off = Normal operation	Off

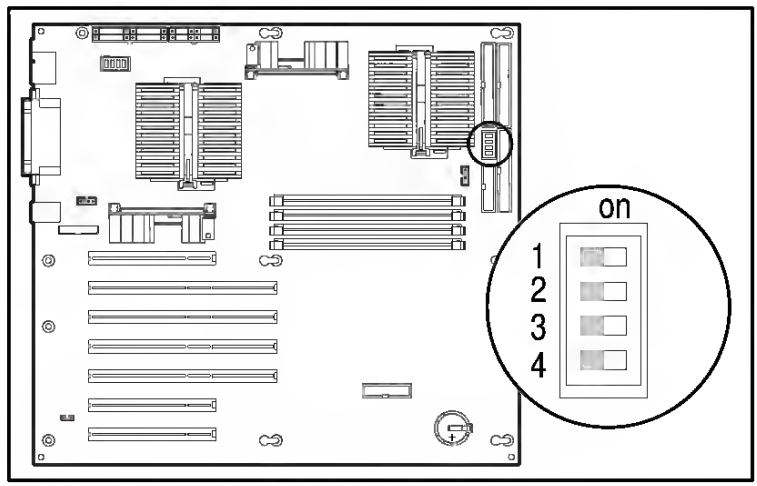

Figure C-1. System board configuration switch (SW1) location

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Server Feature Board Configuration Switch Settings (SW3)

The following table defines the function for each Server Feature Board configuration switch setting (SW3):

Table C-2
Server Feature Board Configuration Switch Settings (SW3)

Switch	Function	Default Position
1	On = Disable video	Off
2	Reserved	Off
3	Reserved	Off
4	Reserved	Off
5	Reserved	Off
6	Reserved	Off
7	Reserved	Off
8	Reserved	Off

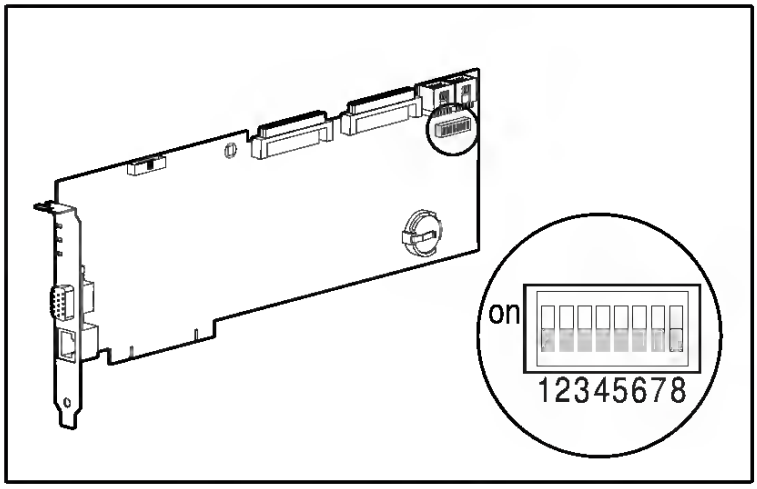

Figure C-2. Server Feature Board configuration switch (SW3) location

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SCSI Device Jumper Settings

No two SCSI devices connected to the same SCSI controller can have the same SCSI ID. If another SCSI device is connected to the same controller, check its SCSI ID before beginning the installation procedure for the additional device. The SCSI ID is set by jumpers ID 3, ID 2, ID 1, and ID 0 located on each SCSI device.

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